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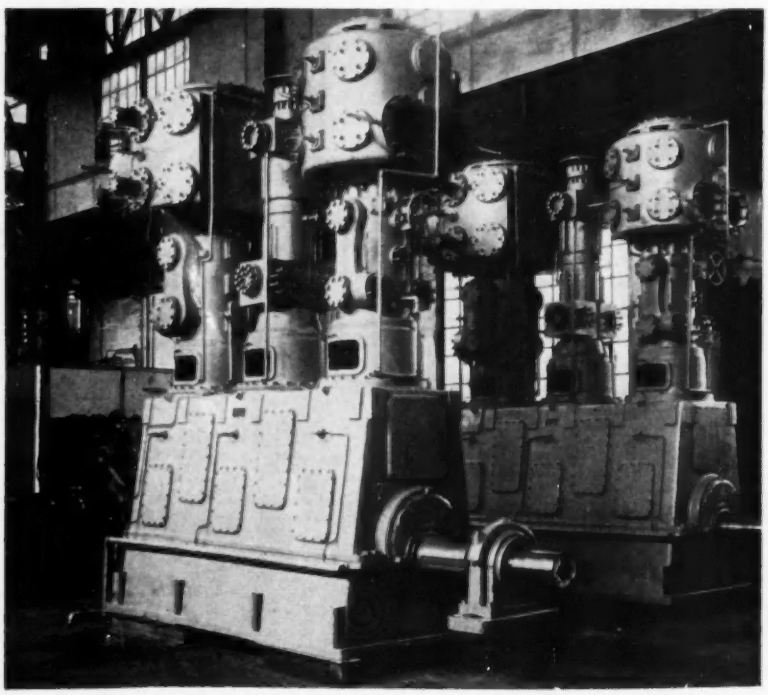

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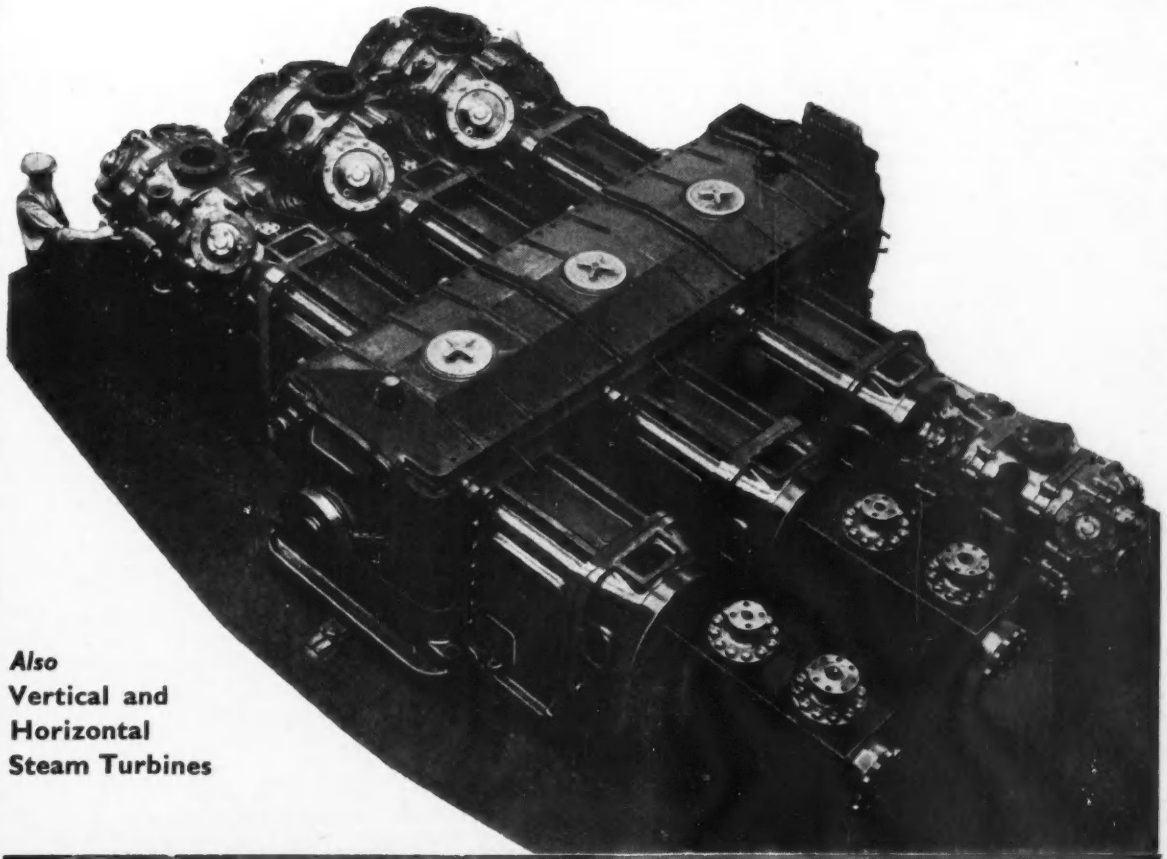

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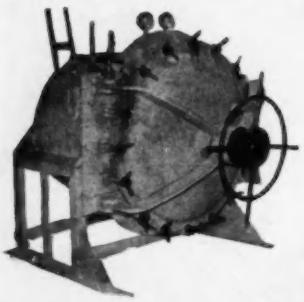

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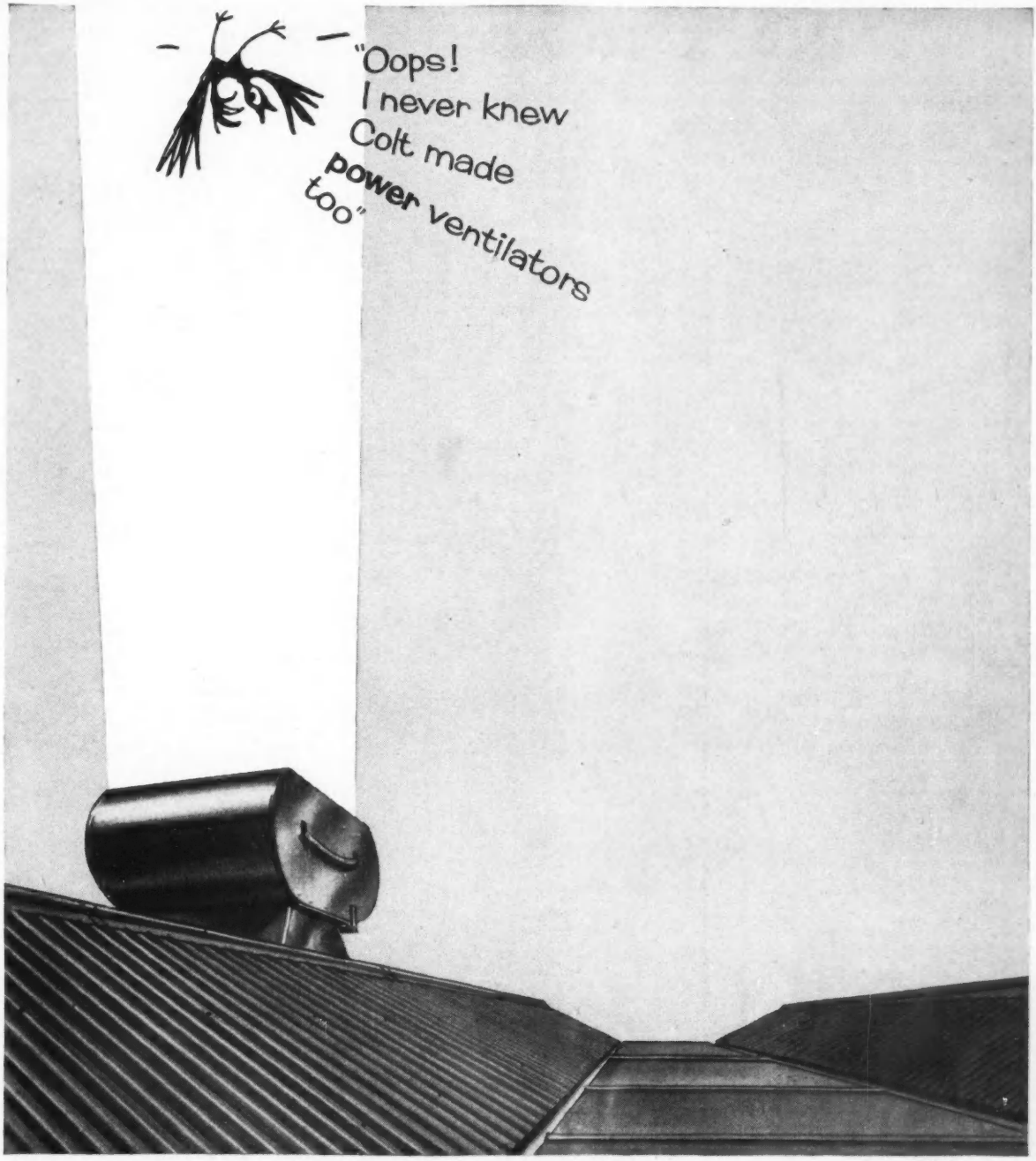

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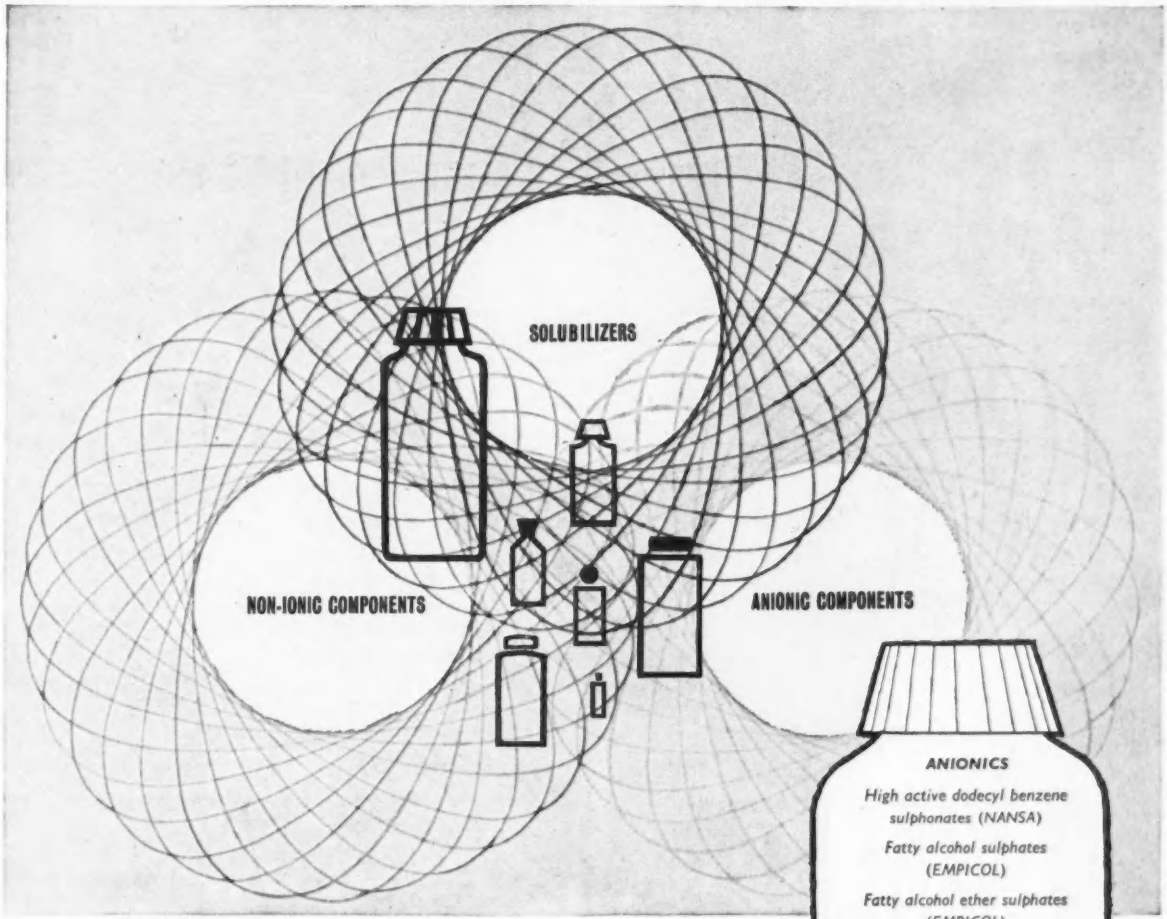

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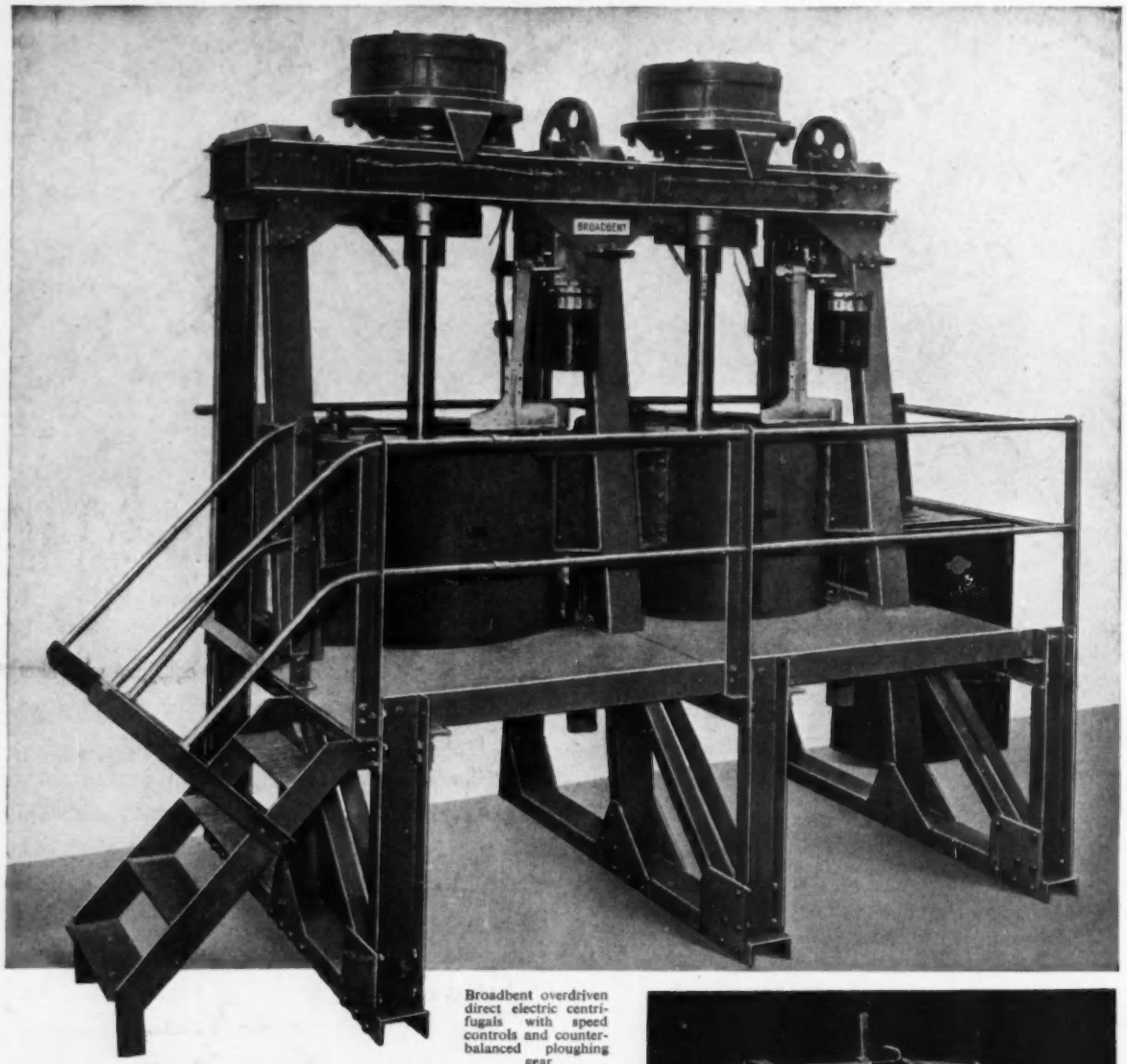

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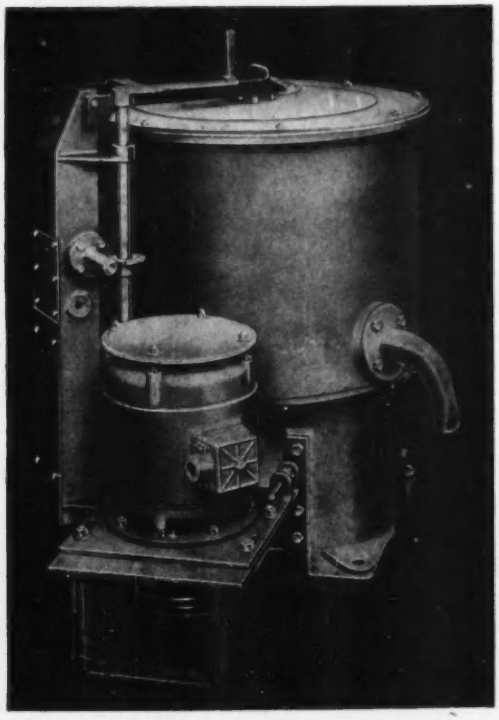

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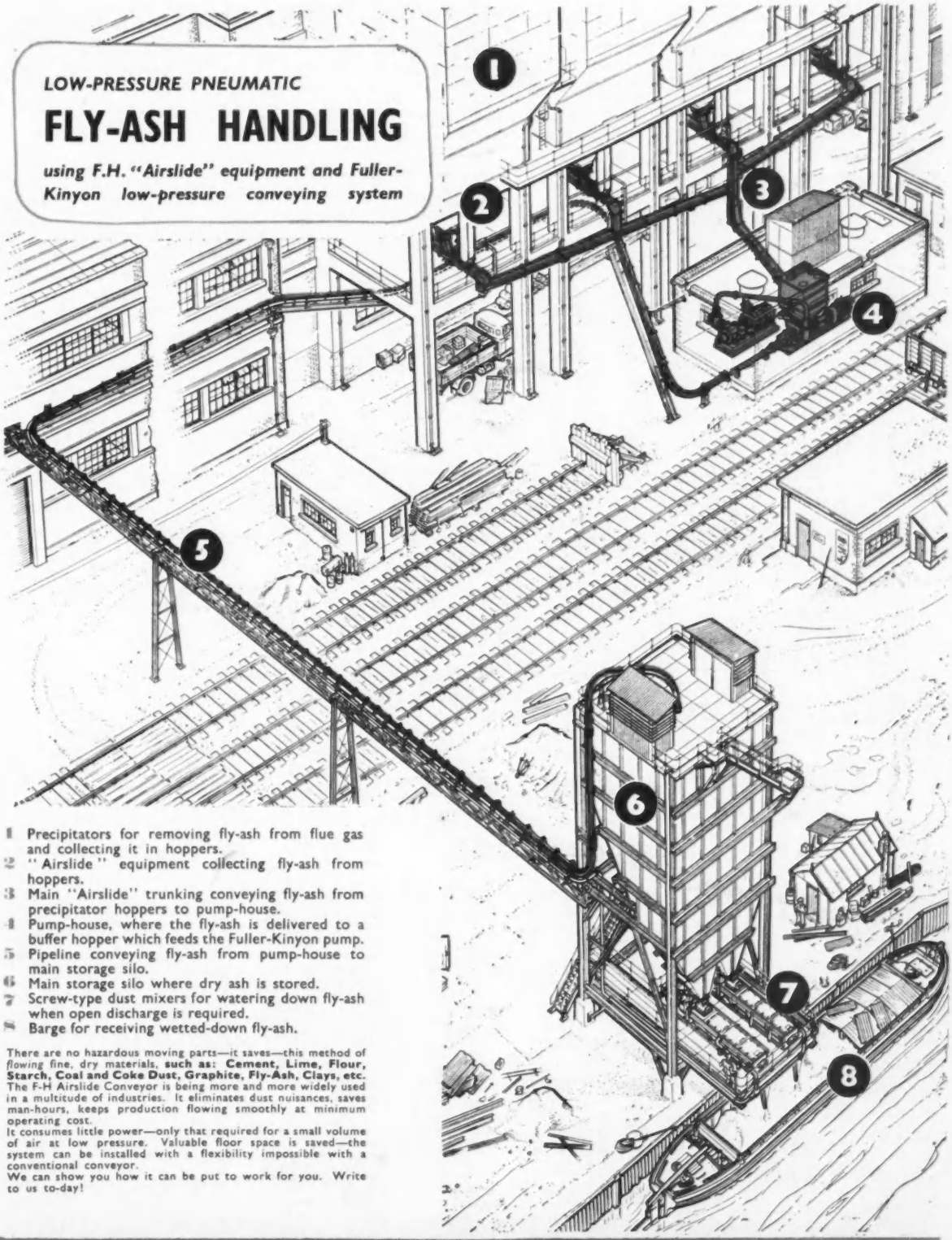

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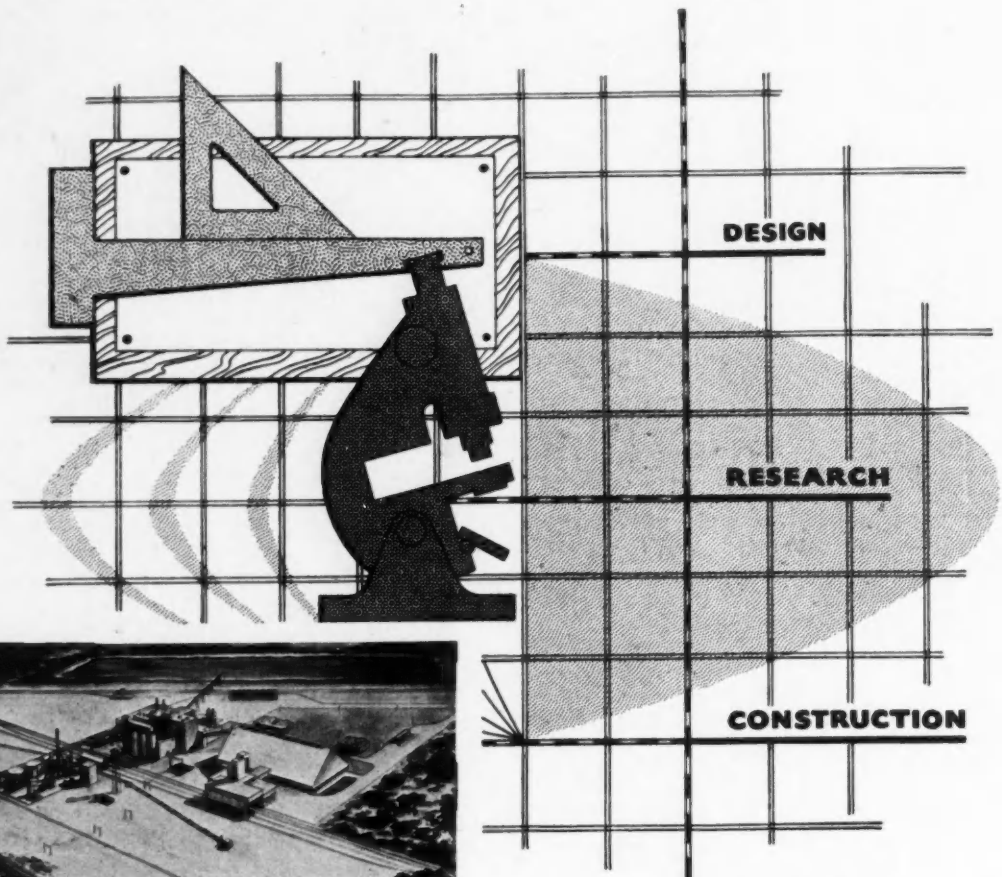

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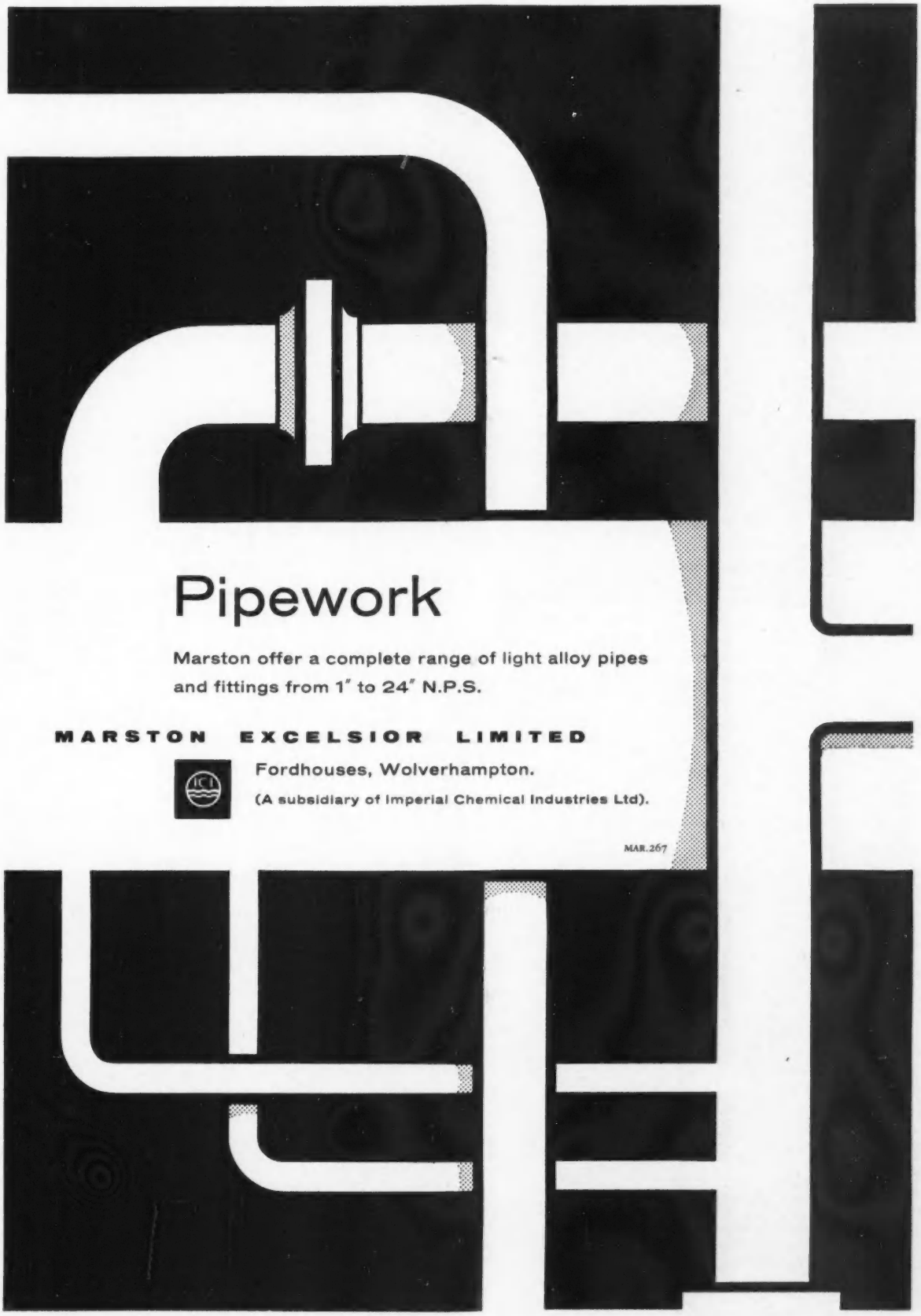
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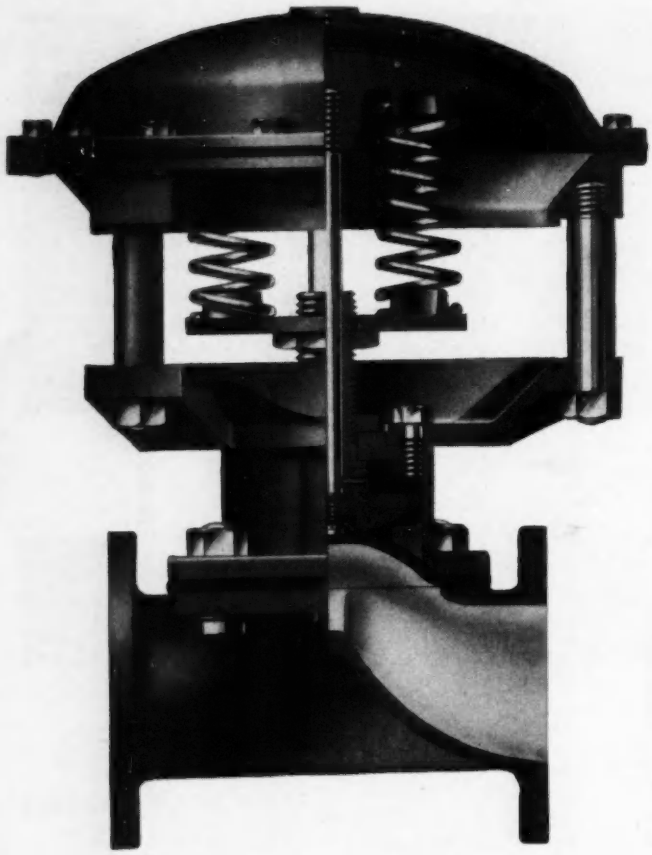

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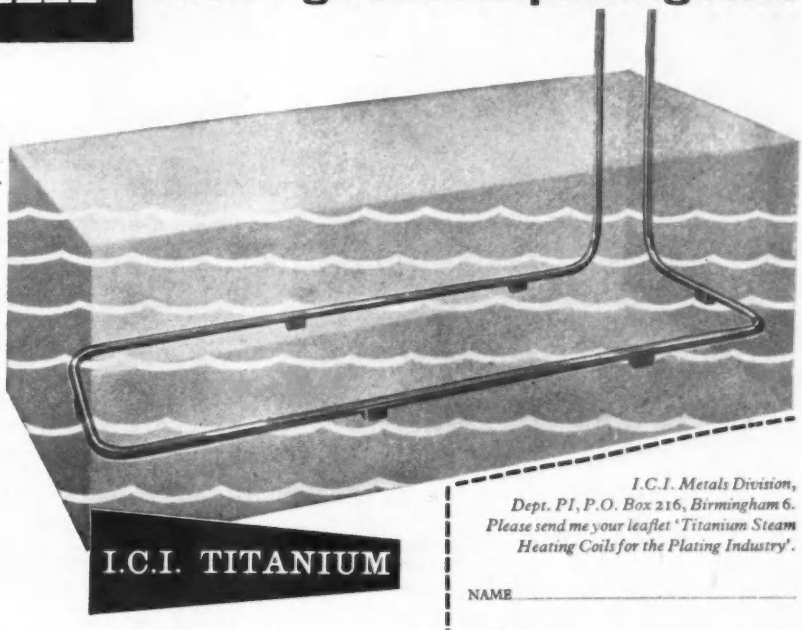

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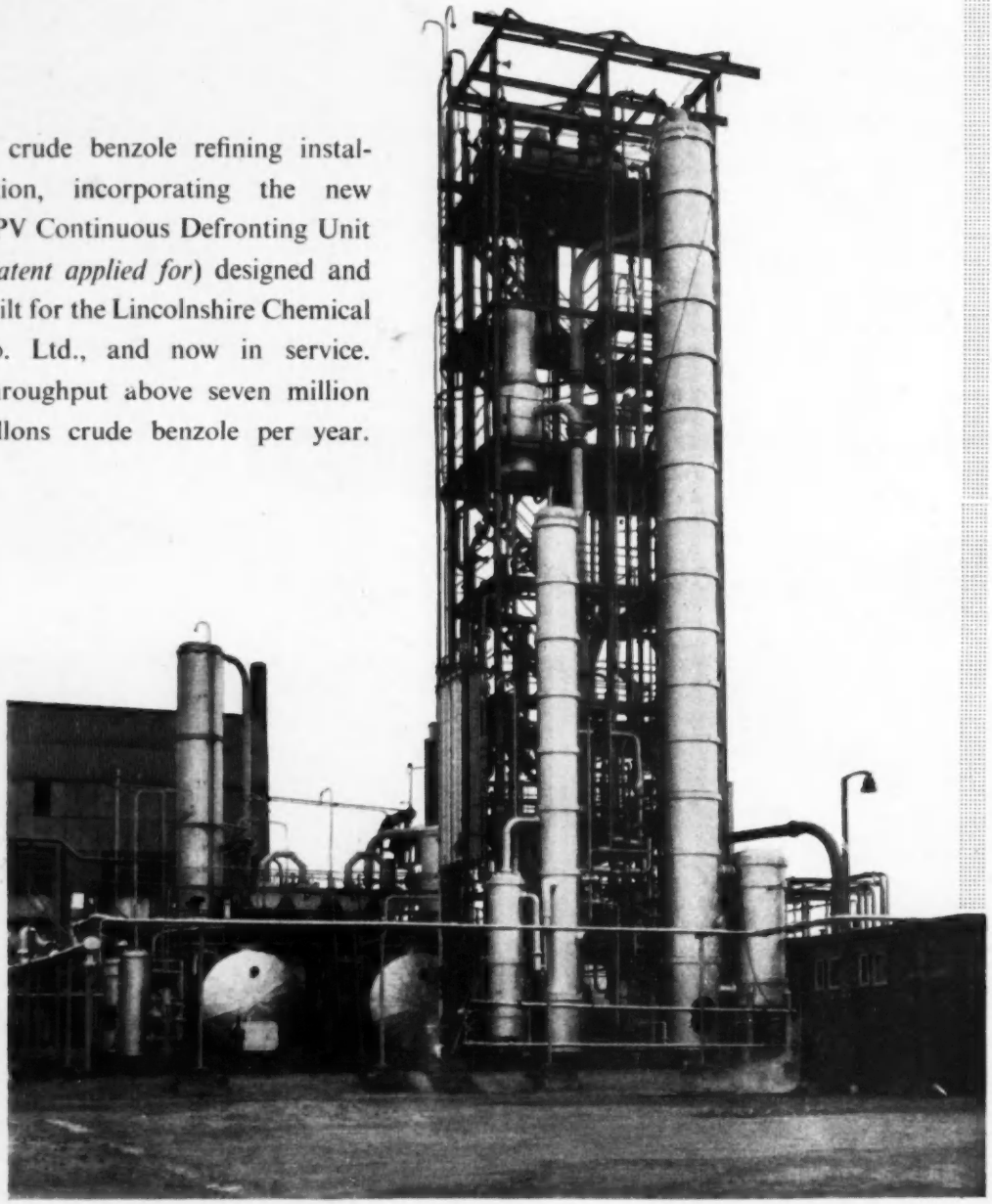

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D

TECHNOLOGICAL EDUCATION

IT is now accepted that technical education must be increased to an unprecedented scale if industry is to be able to use modern science and technology to the full. In 1957-8 the technical colleges provided for the needs of 90,256 full-time students, 485,319 part-time day students and 997,552 evening students. This year the Cantor Lectures at the Royal Society of Arts are on 'Modern Technological and Commercial Education,' and to consider 'Technological Education' (Cantor Lecture II) the speaker was Dr. P. F. R. Venables, principal, City of Birmingham College of Advanced Technology.

Changing needs of industry as the levels of operatives, craftsmen, technicians, professional technologists and management have brought about changes in the structure of technical education, or rather, as Dr. Venables points out, the emergence of a definitive structure for the first time in its history. The first Cantor lecture indicated that four different kinds of colleges are coming into being, broadly differentiated by the nature and level of courses they will provide. Since the nature and level of work of a particular college is closely related to the needs of industry at the different levels of employment, specialised needs will increasingly be met by specialised institutions and it is expected that the individual company will increasingly select a college to meet the particular requirements it has in mind.

Six of the seven national colleges were set up as direct grant institutions of the Ministry of Education to meet the needs of widely dispersed industries, but the creation of such small separate institutions is open to serious objection, and Dr. Venables considers that the White Paper might well have taken the opportunity to make these departments of the colleges of advanced technology.

At the beginning of the 1958-9 session there were 14,942 students of technology in the universities (15% of all students) and until recently, it is learned, for three science students and one technological student attending the universities, the number for the technical colleges was equal but the proportion reversed (i.e. from both full-time and part-time courses).

Some new developments which have great importance for the future have occurred in the post-war periods. Thus the new courses for operatives established by the City and Guilds of London Institute contain less science and maths and are more practical in approach. An innovation is the chemical plant operators course, resulting from the many changes in the chemical industry. Since 1945, however, most of the professional institutions have raised and some are again revising, it is learned, the academic and practical training requirements for the profession and this is having a far-reaching effect on professional technological courses in the colleges. The part-time route through the National Certificate system is becoming increasingly arduous and lengthy in order to fulfil requirements and will increasingly be replaced by the Sandwich course system, especially for the Diploma in Technology. National Certificate courses are seen as becoming increasingly courses for technicians.

Evidence of the need for better technical education is seen in the growth in enrolment for sandwich courses which have increased from 1,500 five

years ago to over 8,000 in 1958: Most of the recruitment has been from the large companies with their own well-established training schemes and facilities for them, and over the next five to 10 years the trend is likely to be strongly towards college-based recruitment.

Study and industrial training combined is hardly four years old and there are naturally many unsolved or only partially solved problems. A question of importance is that of academic standards to be achieved. Two other major aspects of sandwich courses mentioned by Dr. Venables were the need to secure good co-operation between industry and college, and the need to secure the integration of college study and industrial training. The first is being strengthened as in the work of College Advisory Committees, and among new ones being devised are College Joint Consultative Committees of Education and Training Officers of firms and Heads of departments. Then there are Industrial Training Certification Committees, again with representatives of both sides. In addition, visits of teaching staff to industry, to see students in training and for discussion of project work, research and other purposes, are increasing to an encouraging extent. There is much room, however, for research and experiment here. An essential basis must be that college staff should generally have had relevant industrial experience and that there should be enough of them to make adequate contacts and secure co-operation with industry.

There is one other aspect of technical education and industrial training courses. While the need for trained people is great, it is disturbing to learn that out of 100 students who sat the first year examination of the course, only 8% gained the Ordinary National Certificate at the first attempt three years later and only 3% gained the Higher National Certificate in the minimum time of five years. The causes are many and complex, it appears, ranging from defective schooling, lack of innate ability, adverse or difficult home and work conditions, poor teaching, ill-health, etc.

Much progress has been made by the Colleges of Advanced Technology but certain critically important matters still have to be solved before they develop as 'university-quality' institutions. The emphasis so far has been on undergraduate courses but Dr. Venables deems research and postgraduate courses of over-riding importance. For such highly qualified staff are required. But until they can forsee the time when the colleges have full academic autonomy and rights to grant their own awards, they will not come.

It is suggested, too, that there is an urgent need for an academic award at approximately master degree level for recognition of post graduate courses relevant to the needs of industry. Recent progress has been encouraged, but the future holds a challenge. This Dr. Venables considers to be twofold; firstly, the need to create and foster a lively partnership of those engaged in industry and in the colleges, and secondly, to develop new ideas and teaching methods so that the needs of individual students will be fulfilled.

BILL FOR PESTICIDES?

THE need for greater publicity on the part of the pesticide industry to offset ill-informed criticisms of the industry urged in this journal, 10 October, p. 477, was reiterated in London on Tuesday (see page 738 of this isue). The question is an urgent one because these criticisms are mounting. Dismissal of them as a 'hardy annual' is both complacent and dangerous.

There has been much Parliamentary agitation recently on this subject and our Lobby correspondent informs us that a Government bill to regulate the use of toxic sprays is expected to be introduced next year. Few in the pesticide industry will argue with such a move, for there is a dislike on the part of the manufacturers of the use of 'blanket sprays'.

The Bill may prohibit the use of certain arsenical sprays and provide rules for spraying from aircraft. These moves, again, will be welcomed by the industry—the manufacturers have themselves already taken the lead in dropping arsenites from their selling ranges.

These questions have been urgently considered by the Ministry of Agriculture's Advisory Committee on Poisonous Substances and its recommendations are now being discussed with the chemical and agricultural industries, as stated in p. 731. The decisions cannot be long delayed because of the rising Parliamentary pressure, particularly from members representing rural constituencies.

Mr. John Farr, new Conservative M.P. for Harborough, has tabled a motion urging the Government, "in view of the increasing use of toxic sprays in agriculture, the growing damage caused by spray-drift and the absence of any definite knowledge of the effect of these chemical substances upon human beings, domestic animals, wild life and crops", to set up a commission of inquiry to examine the matter and make recommendations.

But many M.P.s believe that there has already been sufficient inquiry and are demanding early action. Mr. John Hare, Minister of Agriculture, is expected to make a statement in the Commons in the near future.

The pesticide industry has much to gain from a closer regulation of the use of sprays and toxic chemicals. But it would be folly to sit back and let events take their course. It would then appear that the industry that had done nothing to put its affairs in order was, of necessity, being regulated by the Government.

Nothing could be further from the truth. The pesticide industry has much to be proud of and a long record of public-mindedness. Through expensive research programmes it has long sought to produce safer and more selective chemicals. Where it has failed, as was pointed out by Mr. F. C. Bawden, director of the Rothamsted Experimental Station on Monday (see p. 738) is in publicising its aims and achievements. Without a well-planned publicity campaign, adverse criticisms can be expected to increase.

POLYTHENE AND ANALYSIS

WELL known to the physical chemist is the permeability of polythene to certain gases and vapours. The analyst these days often has recourse to the polythene wash-bottle, but he may not be aware of the above phenomenon. L. S. Theobald, Chemistry Department, Imperial College of Science and Technology, in a note to latest *Analyst* (1959, **84**, 570) draws attention to this as being likely to be the source of error in analytical work.

Theobald reports that after using a weakly acid aqueous solution saturated with hydrogen sulphide contained in a 200-ml. polythene wash-bottle he found that many fillings and rinsings of the bottle with water at intervals over several days were necessary to remove hydrogen sulphide from the bottle. Hydrogen sulphide from the saturated wash liquid had in fact passed into the polythene itself and was released into the space in the bottle when it was set aside. A similar effect was noted when the bottle was filled with diluted aqueous ammonia, although ammonia was more quickly removed.

Bromine vapour from saturated bromine water rapidly enters polythene, contact for about one minute being sufficient to colour the latter light brown. After 90 minutes contact, the polythene is coloured a deep red, and as with hydrogen sulphide, many fillings with water with intervening periods of setting aside are necessary before the bromine can be removed from the polythene. Removal can be speeded up by passing a current of air through the bottle.

Difficulties have also been noted through nitric acid being absorbed in the walls of polythene vessels and subsequently being slowly released.

New Drug for Asthma from Huffer and Smith

DESCRIBED as a new and effective drug for the treatment of bronchial asthma is Phthalamaquin which is available from Huffer and Smith Ltd., Fine Chemicals Division of C. F. Gerhardt Ltd., New Era Works, Purley Way, Croydon, Surrey.

Chemically, Phthalamaquin is the N, N-diethyl-cis-Δ^4 - tetrahydrophthalamic acid salt of 4-(β-dimethylaminoethylamino)-6-methoxyquinoline. It is hygroscopic and exposed to air tends to change to a gummy mass. To facilitate handling and to eliminate assay errors, the drug is sold in bulk as a 33% w/w aqueous solution. This solution is stated to be suitable for the preparation of elixirs or parenteral solutions. The preparation is also issued in capsule from.

For treatment the drug can be given orally, intramuscularly, or intravenously. Few untoward side effects have been reported and administration is safe for patients with active or healed tuberculosis. Treatment can be combined, it is reported, with aminophylline and other theophylline salts, antihistamines, ephedrine or adrenaline, digitalis, cortisone or ACTH.

Sculptor Inspects Bust of Prof. Norrish

Sculptor Anthony Gray looks at his bust of Professor R. W. Norrish, F.R.S., head of the Department of Physical Chemistry, Cambridge University, at the private view of the seventh annual exhibition of the Society of Portrait Sculptors

I.C.I. (Holland) Has 20% of Dutch Dyestuffs Trade

Turnover of I.C.I. (Holland) is nearly £4 million a year, it is stated in the *I.C.I. Magazine* for November. Plastics are the company's biggest selling line, followed closely by dyestuffs where about 20% of the Dutch market is held by I.C.I. in the face of strong German and Swiss competition. The products of the Heavy Organic Chemicals Division are another big selling line and good business is done in pharmaceuticals. This month I.C.I. (Holland) start their first manufacturing venture with a factory near Rotterdam to make the Lightning nylon fasteners.

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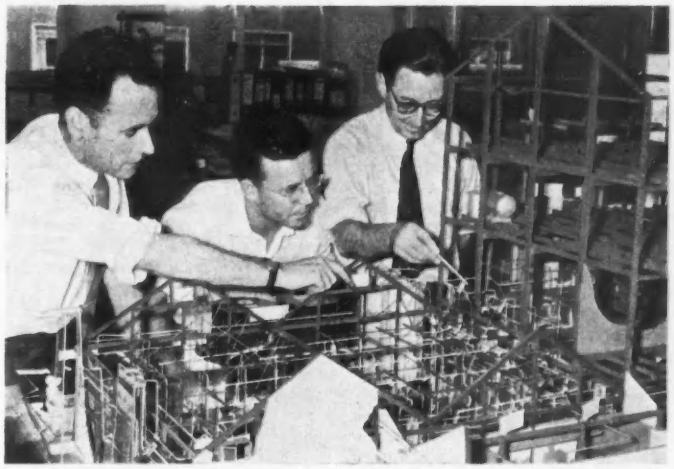


Dennis Green, the model engineer, Alec Lamb, instrument draughtsman, and Tom Jones, section leader, discuss the best route for a process pipe on the sodium chlorite plant model

THE first U.K. facility for sodium chlorite production is now being built by the Laporte Industries Group engineering construction department at the Luton Works of Laporte Chemicals Ltd. The new plant is being erected in the building at Luton that formerly housed the company's hydrogen peroxide plant. This used the electrolytic process and is now superfluous owing to the success of the new automatic oxidation process peroxide plant at Warrington, Lancs.

The Group engineering construction department, housed in Fetter Lane, London E.C.4, is using a detailed model for the design of the new sodium chlorite plant. The use of models has meant increased efficiency and time saving in plant design. Having served its purpose in assisting design, the model is now being sent to Luton where it will be of great help to the construction teams as well as in the training of plant operators. The new plant is due on stream early next year.

Contractors for New Benzole Refinery

CONTRACTORS for what is described as the first U.K. hydrorefining plant to refine coke oven crude benzole to pure benzene have now been appointed. They are Simon-Carves Ltd., Cheadle Heath, Stockport, Ches, and R. and J. Dempster Ltd., 34 Victoria Street, London S.W.1. Consulting engineers for the project are Cremer and Warner, 17 Queen Anne's Gate, London S.W.1.

Designed to treat 4.5 million gall. of crude a year—a capacity that can be doubled—the plant is to be built for the Port Talbot Chemical Co. Ltd., 117 Lichfield Street, Walsall, Staffs, a company formed jointly by the Steel Company of Wales Ltd., and the Lincolnshire Chemical Co. Ltd.

The plant will use coke oven gas as the source of hydrogen. The hydrorefining plant itself is being supplied by Lurgi of Frankfurt, Germany, with Simon-Carves responsible for erection, the procurement of British supply equipment, and the installation of electrical equipment and instrumentation.

Hydrorefining of crude benzole has become almost standard practice in Germany, Japan and many Continental countries where low sulphur benzene is in demand, and it is stated that the unit will be able to meet the increasing U.K. demand for low sulphur benzene. The process is said to overcome the troublesome effluent problem and high physical losses associated with conventional acid refining.

The distillation equipment incorporating the Montz plate has been designed in conjunction with R. and J. Dempster Ltd., to produce maximum yields of 5.35 crystallising point pure benzene on a continuous unit. Low sulphur nitration toluene, xylene, and special high flash naphtha with improved acid wash test and colour stability, will be produced in a vacuum batch column and still.

The new plant will be within the Port Talbot works of the Steel Company of Wales, whose coke ovens will supply the crude benzole and coke oven gas. The installation will be complete with the necessary storage and ancillary plant; an administration and laboratory block will make the works fully self contained.

The new plant is programmed to start up towards the end of 1960, 12 months from date of order.

★ USE of the phrase 'the first in the U.K.' in connection with the new benzole refinery to be built by Simon-Carves and R. and J. Dempster for the Port Talbot Chemical Co. puzzled me (see p. 731). This is a hydrorefining plant, using the Lurgi process, but so also is the new plant that came into operation for the Lancashire Tar Distillers at Cadishead earlier this year (C.A., 4 July, p. 13). This also was described as the first in the U.K.

The distinction, which became obvious on checking details of both plants, mainly concerns the nature of the end-product. The Cadishead circuit will produce motor benzole and a new range of tar solvents. The Port Talbot refinery will use the hydrorefining process to produce chemically pure benzene; the raw material is crude coke oven benzole from the Steel Company of Wales.

★ CHEMICO'S new sulphuric acid selection system for contact plants (see p. 734) is more than a gimmick. With the company's flow sheet brochure, the customer can select over 700 variations of a contact plant—a great help to engineers when selecting a plant. Even if they do not immediately want a plant, many will find it stimulating to work out the hundreds of possible combinations!

The beauty of the system to my mind is the ease with which non-technical executives can follow a design. They can see at a glance the effect on the design of including a filter with the melting pit or tank; or the choice of conversion to SO_3 either by steam cooling, quench air cooling or indirect air cooling.

Although the American spelling on this brochure might lead readers to think that it was produced by the parent Chemico company in New York, I am pleased to say that it represents initiative in the London office. The idea was conceived and carried out by Mr. E. L. Wyatt, the company's publicity manager, who is also a trained engineer.

★ MORE than a 1,000 written enquiries have been received by Acheson Colloids of Box 12, Prince Rock, Plymouth, from industrial organisations since they announced a few weeks ago their new p.t.f.e. dispersions under the trade name Emralon. Many of the enquirers want to test the potential of the non-sintering p.t.f.e. Emralon 810 and 820 coatings.

Potential uses which seem to offer the greatest scope, include, according to Acheson Colloids the treatment of hoppers and chutes handling foodstuffs; aerofoil sections, airscrews, air intakes and ancillary equipment for the aircraft industry; skis, fibreglass boat hulls, lock slides, speedometer cables, fishing tackle, ice box and baking trays, camera magazines, instrument components, slide rules, gas and electric meter parts.

Main advantages claimed for Emralon over pure p.t.f.e. films are that it can be applied to heat sensitive surfaces; it gives better adhesion; and has greater resistance to wear. For the first time thin surface coatings of p.t.f.e. can be produced without using the high temperature sintering process, usually carried out at about 400°C.

★ A PRIZE of Lire 500,000 (£280) is being offered by the Italian Federation of Industrial Producers and Exporters of Wine and Union Vini of Milan for a chemical additive for use in sugar for wine-making. The time limit for entries is set at 31 March next.

The additive must have the following features: harmlessness to humans; absence of colour, smell or taste; non-alteration of products to which it is added; stability and inseparability from the wine sucrose once mixed with it; unaffected by reactions likely to take place in the wine; solubility in wine; it must not be present naturally in wine or sugary substances used by wine-makers.

A tall order, but with £280 at stake some of my readers who combine a knowledge of chemistry with a hobby of wine-making might like to chance their arm. I should add that substances already used as additives cannot be entered for this prize.

★ ONE of the liveliest correspondence topics in *The Times* in recent months followed an article by a special correspondent who wrote on 30 October under the heading 'What's All Right for Jack?' The author claimed that not only was there no loyalty in workers to their firm, but that it was wrong to try to induce it, and I agree with the correspondents who found this to be a somewhat cynical philosophy. It could be, of course, that he was following the time-honoured practice of 'flying a kite.'

In any event, in a letter on Monday, Mr. A. J. C. Gormley, chairman of the International Chemical Co. Ltd., said "a worker is not just a body to be cuddled or kicked, but like all of us he has a heart and soul."

Mr. Gormley firmly believes that workers need something more than a fair wage and salary structure. Where efforts are made by the managing director and his colleagues to satisfy the spiritual and other requirements of workers, not only do labour relations improve, but the material results are also gratifying. That a happy relationship exists at this company is obvious from the fact that the works manager and his team have worked day and night to perfect a new and more economical manufacture of aluminium hydroxide powder, with no thought of payment for the results achieved.

★ THE three companies recently acquired by Laporte Industries have a closely related product range; they also have a considerable affinity with other Laporte companies through their activities. The three companies—Glebe Mines, Sheffield Chemical Co., and James Wilkinson and Son—have been closely knit for many years through inter-trading and co-operation as well as through their directors and some of their largest shareholders.

The products new to the Laporte Group range are fluorspar, hydrofluoric acid and fluorides. The compound prepared by Wilkinson's from hydrofluoric acid include fluorides of sodium, potassium, magnesium, barium, lead, zinc, lithium and chromium. There are also double fluorides, silicofluorides and borofluorides. It is planned to base all Wilkinson's production of fluorides on their Rotherham works, releasing an area at the Sheffield works.

The Sheffield Chemical Co. produce sulphuric acid at their Don Vitriol Works, Sheffield, and at Rotherham where they have a number of contact acid plants. Glebe Mines sell some acid-grade fluorspar direct, while the remainder goes to Wilkinson's for the production of hydrofluoric acid and fluorides. They also sell lead concentrate to smelters for the production of metallic lead; and they will now also supply barytes to augment Laporte Chemicals existing source from Silverband for the production of barium compounds.

★ FEW will argue with the sentiments expressed by Mr. W. R. Beswick, senior partner in Industrial and Process Engineering Consultants (Great Britain) and chairman of the Chemical Engineering Industry Standards Committee of the British Standards Institution. Writing in the current issue of *B.S.I. News*, he says that chemical engineering is a young, vigorous industry that continues to expand yearly at an increasing rate.

There is no doubt that the most prominent British Standard in this field is 'B.S. 1500'—the manual for the design, construction and inspection of fusion-welded pressure vessels. This is now in the course of a timely revision. The first part, dealing with carbon and low alloy steels has been published, but already an amendment to it has been proposed to allow higher design stresses to be used and to enable design engineers to take advantage of the latest design data.

This most important amendment will bring British-designed pressure vessels more into line with Continental designs with regard to thicknesses.

Alembic

Letters to the Editor

Differences in British and U.S. Chemical Market Research

SIR,—The writer has been observing various statements in CHEMICAL AGE concerning the difference between chemical market research in Europe and in America. I am president of Robert S. First, Inc., an organisation that specialises in chemical market research, expansion and diversification studies, and foreign technical liaison. Over the past year we have accomplished more chemical market research in Europe for American companies than any other organisation. I thus thought that you might wish to have our views on the differences between chemical market research in Europe and the U.S. These views are summarised below:

1. There is far less published data in Europe as compared to the U.S. Not only is there less data about the production, consumption, and distribution of chemicals, but there is less data available on individual companies. Many very large chemical companies in Europe do not publish their sales volume. All this means that it is somewhat harder to start a market research project in Europe as compared with the U.S.

2. There is no large trained group of market researchers in Europe. Most market research is done by top executives. Now, since the executives are very busy with many other functions, this means less market research is accomplished in Europe.

Little Contact

3. Except for the very high levels of the company, there is very little inter-company contact between individuals of the European chemical industry. Since market research is based upon calls and personal contacts are extremely valuable, this means that the market research function is harder in Europe.

4. A great deal of information is regarded as confidential by European chemical companies while the same data would not be regarded as confidential in the U.S. This, again, makes market research more difficult.

5. Calls in Europe tend to be somewhat more formal, and it is much more necessary to make appointments in advance as compared to the U.S. This means that a market researcher usually makes fewer calls per day in Europe as compared to the U.S.

6. There are not many trained chemical market research consultants in Europe. Most chemical consultants are highly technical and not commercially oriented. Most market research consultants are not technically trained and have very little concept of the chemical industry.

7. To produce the same amount of work in Europe as compared to the U.S., is much harder because many services are not as efficient. To telephone from Paris to Stockholm is a real time-consuming project, while to telephone from San Francisco to Montreal takes about 2 minutes. To rent a car in certain European cities is still a big project, but this is changing rapidly. Office mechanisation in Europe is far behind the U.S., but here again rapid strides are being taken.

These observations are merely personal observations of the writer as he and his associates have travelled through Europe extensively over the past year. They are in no way to be taken as critical of the European chemical industry or of European chemical market research. The writer has made many good friends in Europe over the past several months, and has been privileged to learn a great deal about the European chemical industry and about European business methods.

Yours, etc.,
ROBERT S. FIRST,
President.

Robert S. First, Inc.,
New York, U.S.A.

Automatic Polarography in 1936

SIR,—I was particularly interested in the first item of your 'Distillates' on page 608 of the issue of CHEMICAL AGE dated 31 October 1959. While I agree that credit for recent developments in polarography is rightly given to several researchers of the Atomic Energy Authority, the earlier position is by no means unsatisfactory.

Very many industrial laboratories possessed and used polarographs in routine work even before the commencement of the Second World War and during the war there was a notable expansion in the number of machines being used and in the scope of their use.

I was using an automatic polarograph myself in this country as long ago as 1936 and routine work was being conducted with an automatic polarograph under my direction at Peter Spence and Sons Ltd., Widnes, in the early years of the war. The method indeed was so firmly established in industry that the Polarographic Discussion Panel which had been set up by the Society for Analytical Chemistry (then the Society for Public Analysts), discontinued its activities in February 1954.

Yours faithfully,
W. CULE DAVIES,
Research Manager.

Associated Chemical Companies Ltd.,
Central Research Laboratories,
Leeds 5.

Bayer Polycarbonates at Dusseldorf

SIR,—We would like to take issue with you over an article by one of your reporters in the 7 November issue, wherein part of the Dusseldorf Fair was covered.

This refers only to the paragraph headed polycarbonates. Briefly, this is the position.

Polycarbonates are manufactured in Europe only by Farbenfabriken Bayer AG, the moulding material, under the trade mark Makrolon, and the foils under the trade name Makrofol. There are two grades of moulding material—Makrolon S for injection moulding and Makrolon E for extrusion, and by arrangement with J. M. Steel and Co. Ltd., we sell Makrolon S and E in the U.K. J. M. Steel and Co., themselves sell Makrofol in the U.K.

Although it is true to say that practically any thermoplastic is always 'in development', we would like to point out that Makrolon and Makrofol have been freely available from bulk in this country from early this year, and a full technical and commercial service is offered by this company and by our friends J. M. Steel.

We are enclosing a booklet which you may like to use in the way of explanation, why it was that *only* Farbenfabriken AG displayed polycarbonates as raw materials, and also why *not* unexpectedly the comprehensive range of polycarbonates were exhibited by West German companies.

Yours faithfully,
D. J. TURPIN,

R. H. Cole and Co. Ltd.,
2 Caxton Street,
London S.W.1.

(This booklet referred to is entitled 'Makrolon' and details comprehensive laboratory and field tests by Bayer AG. Our reporter used the term "unexpectedly", because it was widely thought that the U.S. producers of polycarbonates, the General Electric Company, would either have had their own stand, or would have exhibited through their agents. The reference to "still under development", refers to new grades that are being evaluated.—*Editor.*)

Robinson's Build Plant for N-methyl Morpholine

A plant for the manufacture of N-methyl morpholine is under construction at the works of Robinson Brothers Ltd., Ryders Green, West Bromwich, and is due to come on stream during March 1960. Chief use of N-methyl morpholine is as a catalyst in the manufacture of polyurethane foams. Prices, samples and specification are available on request.

S.C.I. Visit Courtaulds

Visit of the Manchester section of the Society of Chemical Industry to Courtaulds, Trafford Park Works, recently, included inspection of the boiler house and the plant for making carbon disulphide and sulphuric acid. At the end of the tour the versatility of carbon disulphide as an intermediate was demonstrated by a display of products.

700,000 Tons of Polythene

Total world sales of polythene are expected to be about 700,000 tons this year, state I.C.I., of which about 90% will be made by the original high pressure process.

Chemico Flowchart Gives Plant Customers 700 H_2SO_4 Designs

Using the flowchart to select a design for a sulphuric acid contact plant

ANY of over 700 available variations of design for sulphuric acid contact plants can be selected from a new flowsheet brochure devised by Chemical Construction (G.B.) Ltd., 9 Henrietta Place, London W.1. This range is said to represent most of the well known major combinations of contact plant design.

On stiff board, the brochure opens out to a width of just under 3 ft. A flowsheet of a basic contact plant measures 22 in. by 8 in. Ten numbered tabs can be folded down over the flowsheet to cut out certain items of equipment or to include others, according to the type of plant needed. Each section of the flowsheet is numbered. Customers can select the plant design they require and can choose from the many alternate arrangements the principal equipment items. A note of the numbered items is passed to the company and its engineers can co-operate in establishing the final design.

The flowsheet indicates a basic sulphuric acid plant with numbers shown in brown: these items are: (1) Sulphur melting pit or tank; (2) sulphur furnace (including sulphur spray burner); (3) waste heat boiler (fire tube type); (4) Chemico gas filter; (5) heat exchanger; (6) converter (steam cooling); (7) economiser; and (9) absorption tower and drying tower.

Variations to this design, which can be folded over to make the basic units on the master flowsheet are numbered in blue. These are: (1A) sulphur melting pit or tank with sulphur filter (if impure sulphur is used); (3A) waste heat boiler (forced circulation type, preferable for plants of about 200 tons/day capacity and above, depending on pressure required); (4A) gas filter (not usually needed when sulphur filter (1A) is used); (6A) converter (quench air cooling if superheated steam and maximum steam production are not needed); (6B) converter (indirect air cooling); (7A) SO_3 cooler (if maximum steam production is not needed, this can be installed at lower capital cost than an economiser); (8) oleum tower, (8A) oleum tower (without pump tank, which can be eliminated on small and medium acid plants); (9A) absorption tower and drying tower (without pump tanks); (10) dilution equipment (if less than 93% acid is required).

In addition to informing Chemico of the numbered items required, customers are asked to complete a plant selection card giving details of capacity of 100% sulphuric acid per 24 hours, location, type and source of sulphur, sulphur analysis, product strength, site conditions such as elevation, soil-bearing load, etc., water supply, including suspended solids, analysis of cooling water, etc., steam supply (if existing) and disposal, and power supply.

Chemico claim that for the first time, a customer can with the use of this flowsheet selection technique order a contact plant by telephone and, if necessary, make alterations in the basic design once the order has been placed, merely by making a telephone call.

Chemico, who have completed more than 1,200 projects all over the world to a value of over $2,000 million since they were formed in 1914, have in the last 30 years built 190 sulphuric acid plants with a total capacity of 24,198 tons per day. With units ranging up to 600 tons per day, Chemico-designed contact plants are said to represent more than 30% of the world's total capacity.

Since 1950, the company has built an average of 7.2 contact plants a year with a total daily capacity of 1,400 tons. Contact plants designed by the company in the U.S. total 97, with a capacity of 17,114 tons/day; a similar number (93) has been built outside the U.S., but with a total capacity of 7,084 tons/day. This gives an average capacity for U.S. contact plants of 172 tons/day, against an average capacity of other units of 77 tons/day.

The company's sulphuric acid plants under construction in 1959 (with tons per day H_2SO_4 and raw material shown in brackets) are: Buffelsfontein Gold Mining Co., South Africa (110, pyrites); Dixon Chemical Industries, Paulsboro, N.J. (860, sludge); Valley Nitrogen Producers, Helm, Cal. (150, sulphur); Lago Oil and Transport, Aruba, N.A. (215, sludge); British Titan Products, Billingham (250, sulphur); British Titan Products, Grimsby (180, sulphur); M. D. Ewart, Pusan, Korea (10, sulphur); Pak Chemicals, Karachi (10, sulphur).

Radiation Processing with Gammacell 220

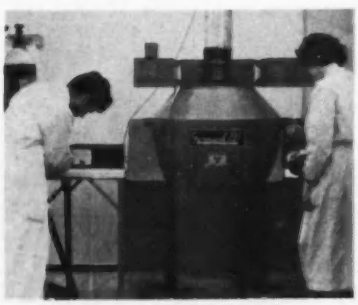
MARKETED in this country by Watson and Sons (Electro-Medical) Ltd., the gamma ray irradiation cell is available for laboratory experiments and small-scale radiation processing.

Built by Atomic Energy of Canada Ltd., the equipment is suitable for irradiation of plastics, radiation chemistry, production of mutations in seeds for agricultural research, the destructive effect of radiation on materials and the preservation of food, and other investigations. It can also be used for the sterilisation of pharmaceuticals, surgical equipment and similar materials.

Simple in operation, the unit is self-contained and can be installed in existing laboratories. Remote handling is not necessary, the external radiation field is very low, and it is claimed that no radiation hazard can occur due to mishandling.

Radiation source consists of a ring of cobalt 60-rods, mounted around a stainless steel cylinder which is embedded in a shielding block. The cylindrical sample chamber is loaded and unloaded above the source, into which it is moved by a motor. The sample volume is 6 in. diameter by 8½ in. high, and the irradiation dose rate with a 1,100 curie source is approximately 10^5 roentgens per hour. Maximum source strength depends on working conditions near the cell and is between 13,000 and 30,000 curies, giving a maximum dose rate of about 2×10^6 roentgens per hour.

Overall dimensions of the approximately cylindrical unit are 40 in. by 60 in. by 77 in. and the weight is 7,600 lb. Further particulars may be obtained from the U.K. agent, at East Lane, North Wembley, Middlesex.



Gammacell Model 220

Gas Research Meeting

Vacuum Carbonate and Contact Sulphuric Acid Plants at Beckton

UNIQUE in Britain is the Koppers vacuum carbonate plant associated with a contact sulphuric acid plant installed at the Beckton Works of the North Thames Gas Board. Reasons for the adoption of the Kopper's process were discussed this week by L. S. Cooper, Fulham Research Laboratory, and R. M. Johnson, Beckton Works, at the 25th Autumn Research Meeting held in London, 17 and 18 November, by the Institution of Gas Engineers.

In considering improvement of purification facilities at Beckton after the Second World War it was felt that oxidation processes were not suitable, because of the secondary reaction products, which cause corrosion, effluent problems, and loss of reagent. The most promising system was deemed to be the hot acidification process introduced by Koppers Co. at Pittsburg in 1942, and now known as the Koppers vacuum carbonate process. This process has been investigated jointly by the Gas Light and Coke Co., and the Woodall-Duckham Construction Co. Ltd. The latter, who hold the licence for the process in this country, were requested to erect an installation to operate on 13 mill. cu. ft./day of coal gas.

Design Standards

The Beckton plant was designed to reduce hydrogen sulphide in the gas by 90% from 480 gr./100 cu. ft. and hydrogen cyanide by 85%, from 60 gr/100 cu. ft. composition of the recovered H_2S gas was expected to be about 70% of H_2S, 10% of HCN and 15% of CO_2.

The method of utilisation of the recovered H_2S was also considered. Because of low efficiency and high acid exit gas a Claus kiln was ruled out and a plant for production of H_2SO_4 from recovered H_2S seemed desirable. Lurgi, in Germany had developed the wet contact process in which SO_3 and steam were condensed by cooling with H_2SO_4 and the remainder removed from waste gases by an electro filter. With regard to the HCN, Lurgi indicated that this could be burnt almost completely to water vapour, CO_2 and nitrogen. It was therefore decided to install a plant employing this process as a complementary unit to the Koppers' plant and Huntington Heberlein (licensees for the Lurgi process in the U.K.) were engaged as sub-contractors to Woodall-Duckham, to build the plant, design capacity to be for the production of 12-75 tons 78% H_2SO_4/day.

Koppers, Vacuum Carbonate Plant. Coal gas enters the base of the absorber at 75°F or less, and is washed countercurrently with a 5 to 6% sodium carbonate solution, spray distributed, at a rate of about 8,500 gall./hr. The absorber tower is 72 ft. high and 98 ft. 6 in. dia. and is packed over 44 ft. 4 in. of its height with board packing, 5¾ in. by ½ in. boards, with ½ in. spacers.

Treated gas leaving the absorbers passes an entrainment separator, to existing oxide purifiers, for completion of H_2S removal. Fouled circulating solution, containing H_2S, HCN and CO_2, absorbed from the coal gas, is pumped by a steam-driven centrifugal pump from the base of the absorber to sprays at the top of the actifier, a steel tower 77 ft. 9 in. high and 8 ft. 6 in. dia. with dished ends and strengthening bands designed to withstand a vacuum of 30 in. Hg; it is completely lagged on the outside and the inside is board-packed like the absorber. H_2S gases are removed from fouled solution by counter-current stripping with steam, under high vacuum conditions. The sweep stream is provided by boiling the solution at the base of the actifier, using a re-boiler consisting of two nests of tubes, heated by low-pressure steam at 5 to 7 lb./sq. in. Boiling temperature of the solution at absolute pressure of 4 in. Hg is about 125°F.

Hot actified solution is pumped from the base of the actifier, via three coolers (water tube in shell type) in series to sprays at the top of the absorber, for recycling: the solution is cooled to about 75°F. H_2S gases, together with stripping vapour, pass from the actifier, via an entrainment separator through a vapour condenser, vapour cooler and a knock-down tank, before entering the vacuum pump. After leaving the vacuum pump H_2S gas passes through a catch tank and thence to the acid plant; provision is made by automatic relief valve for the gas to return into the coal gas stream to purifiers if the acid plant is not in a position to handle it.

Contact Acid Plant. H_2S from the vacuum carbonate plant is fed to the contact plant combustion chamber, and filtered air is provided in sufficient quantity for combustion of the gas, and for subsequent oxidation of the SO_2 to SO_3, at the converter.

Exit gases from the furnace at 1,100°C are cooled to about 450°C by a waste-heat boiler and then enter the converter at the top, pass downwards through four trays of vanadium catalyst, and out to the condensation tower. H_2S is oxidised to SO_3 and the heat evolved is controlled by direct air admission between first and second trays and also by a jacket surrounding the vessel.

In the condensation tower—a lead- and brick-lined ring-packed vessel—circulated, cooled H_2S condenses and absorbs most of the SO_3 and water vapour. The remaining SO_3, now at a temperature not more than 50°C and in the form of an acid mist, passes to a lead-lined electrostatic demister, for complete recovery; exit gases go to atmosphere, via a lead-lined stack.

Foul Gas Analysis

Typical Analyses. Foul gas at Beckton, in a typical analysis, contains 72% H_2S, 11% HCN and 15% CO_2. This is equivalent to the removal of approximately 85% H_2S, 80% HCN and 10% CO_2. Since CO_2 is not completely stripped in the actifier, a material part of the soda is permanently converted to bicarbonate. Minor constituents of the gas can decrease the efficiency of the plant. Ammonia dissolves in sodium carbonate solution, the bulk of it being expelled with the actifier gases: it then dissolves in the condensate when this gas is cooled, increasing the solubility of H_2S. With the condensate returned to the system, overall efficiency of the process is reduced.

Blockages. Naphthalene, although only slightly soluble in the solution, may cause blockages in the actifier vapour system. Blockages may also be caused by formation of a polymeric substance of cyanogen and thiocyanogen compounds, occurring mainly at the outlet side of the vacuum pump, although this can occur in the vacuum system and circulation solution. Formulation of this substance is believed to be promoted by ammonia and tar bases. Experience has shown that its rate of formation increases with rising temperature and that it is probably only produced in aqueous conditions.

Contact Acid Plant Gases. An unusually large amount of HCN is contained in the gases. In burning HCN,

Operating Cost/day of Vacuum Carbonate Plant and Contact Acid Plant at Beckton

	Vacuum Carbonate Plant	Contact Acid Plant
	£ s. d.	£ s. d.
Power at 1½d./kWh.	6 12 0	5 1 6
Steam: H.P. at 63s./10,000 lb.	31 10 0	—
L.P. at 35s/10,000 lb.	10 17 0	—
Cooling water at 8d./1,000 gall.	—	3 4 0
Boiler feed water at 4s./1,000 gall.	—	7 2
Process water at 1s. 4½d./1,000 gall.	—	1 0
Sodium carbonate at 15s. 4d./cwt.	11 6	—
Shift labour	3 9 1	6 17 2
Replacement of catalyst	—	6 0
Technical and lab. supervision	1 10 0	1 10 0
Maintenance, labour and stores	4 15 0	2 0 0
	£59 4 7	£19 6 10
Less Credit for high pressure steam produced		£5 13 5
		£13 13 5
Cost of producing 12¾ tons 140° Tw acid/day		£72 18 0
Cost/day ton of acid		£5 14 4

Cost of Purification by Vacuum Carbonate and Contact Acid Plants including Final Oxide Purification, compared with Cost of Complete Purification by Oxide alone

	Per day £ s. d.	Per therm Pence
Operating cost of vacuum carbonate and contact acid plants	72 18 0	0.240
Final purification by oxide	20 0 5	0.066
Total cost	92 18 5	0.306
Revenue from sale of acid	95 12 6	0.315
Credit difference	2 14 1	0.009
Cost of purification by oxide alone	116 3 6	0.383

although the greater part is converted to N, CO_2 and water vapour, some ammonia and nitric oxide is formed and some HCN remains undecomposed. HCN and NH_3 may subsequently be oxidised on the catalyst, so these constituents, as well as NO_2 can cause H_2SO_4 to be contaminated with nitrogen acids, and possibly corrosion of the lead electro-filter. It was thought that best results were achieved at about 900°C using a packed combustion chamber, but laboratory work has shown that residual N compounds are just as low after combustion at 1,100°C without a catalyst. At higher temperatures residual HCN is lower with a catalyst, but the amount of NO_2 is greater, giving a higher total of nitrogen compounds. Nitrogen oxides either condense in the H_2SO_4 or escape to atmosphere. Increase in temperature results in a smaller concentration in the acid, but corrosion may increase. Total nitrogen acids in H_2SO_4 made at Beckton has been about 0.25% w/w expressed as HNO_3 and nitrogen oxides in stock gas has not exceeded 0.06 gr./cu. ft. expressed as equivalent SO_3. Sulphur acidity of the waste gas is usually less than 1 gr./cu. ft. expressed as SO_3.

Conflicting Effects

The two conflicting effects of temperature in converting SO_2 to SO_3, where equilibrium yield decreases with increase of temperature, but at low temperatures the reaction is slow, is balanced in practice by working with a catalyst inlet temperature of 430°C and an outlet temperature of 400°C. Conversion efficiency has been 98.5% or better.

Operational Experience. The vacuum carbonate plant went into operation on 10 July 1957, and as the contact acid plant was not ready, extracted H_2S was returned to the coal gas stream at the inlet to the oxide purifiers. Commissioning the plant was the responsibility of Woodall-Duckham and early operation was covered by that company's technical staff. In July 1958 the N.T.G.B. took over although Woodall-Duckham continued to take an active interest in progress and are still concerned with certain aspects of performance.

Since July 1957 the plant has been in operation for only about 12 months, and in periods ranging from one month to five months' duration. Early troubles were leakage of H_2S from glands of the vacuum pump. Additional ventilation had to be provided which was achieved by a duct at floor level connected to an electrically driven extractor fan exhausting to a height above roof level. Cause of the leakage was corrosion and failure of the garter spring in the metallic packing of the pump glands. Replacement in stainless steel overcame this trouble, and as a precaution the glands of the pumps were enclosed.

Circulating solution coolers and H_2S gas coolers were not satisfactory. Inspection revealed that the water side of the cooler tubes was considerably fouled by rust scale; cleaning because of the small bore 13/16 in. tubes proved to be arduous. This fouling of cooler tubes has been a recurring problem and in spite of chemical dosage of the cooling water, the effect is apparent within a very short period of working time, i.e. about two months and at less than two-thirds of design load. The solution coolers, it is estimated, will require cleaning twice a year. Chemical cleaning is now being tried.

Undesirable Temperature

An undesirable high temperature of H_2S gas at the inlet to the vacuum pump, means increased load on the pump and difficulty in maintaining a high vacuum at the actifier.

Design of the coolers leaves no margin for even slight fouling; fitting metal strips to the baffles in the solution and gas passes of the coolers, to reduce short circuitings, has resulted in only a slight improvement.

Disposal of condensate from the vacuum pump catch tanks was another problem. The original system of high- and low-level electrode control for automatic pumping away never worked satisfactorily. This was therefore abandoned in favour of a system of control, by a float operating through a magnetic switch to the pump motor and this has proved very satisfactory. When the contact acid plant came into operation in May 1958, polymer formation in the H_2S gas services to the burner occurred, with blockages mainly at the ceramic filters and the flame traps. A major factor in polymer formation appeared to be liquid deposition in the gas services which was more than could be attributed to condensation. By fitting a simple baffle chamber, and cooling the outside of this and also the catch tank, it has been possible to reduce considerably the liquid deposition. Provided that the design temperature of 75°F at the vacuum pump inlet is obtained, it is expected that the after cooler will give a suitably lower temperature of gas, which would result in less liquid deposition in the services and less trouble with polymer formation.

Total working time of the contact acid plant has amounted to three weeks in 1958 and just over four months in 1959. Start-up and early operation was successfully carried out by Huntington Hebelein, but polymer blockage interrupted the first day of the three-day guarantee test.

Delay in re-starting the plant was partly due to reconditioning of points of the plant affected by the long shut-down period. A number of valves in the gas lines were found to be corroded and had to be replaced. Reconditioning on the instrument conduit services and other items of plant was also necessary.

Start-up was in February 1959, and production of acid, at a starting load of 56%, later increased to 80% of design capacity. Blockages due to polymer have been frequent. The ceramic filters affected were designed to remove particulate solids from relatively dry H_2S gas, but due to excessive entrained and condensate liquid, they tended to log out and cause blockage; it was possible that logging out of the filters increased entrainment at that point and resulted in blockages further down the line at the flame traps. Replacing the elements in the filters by a similar number of open tubes made a conversion to a simple baffle chamber, and liquid deposition and polymer blockage at the traps was considerably reduced.

Design and Efficiency. Vacuum carbonate plant performance has been found to be closely related to the effectiveness of the coolers, particularly the vapour coolers. The presence of rust in the coolers is stated to be partly responsible for their deficiencies. It is considered that the 90% design extraction efficiency could be obtained, even with capacity loading, if a reasonable period could be worked with the desirable gas temperature at the inlet to the vacuum pump. Although a small loss in extraction efficiency makes little practical difference to the final purification of the stripped coal gas, the loss of acid production is of economic importance.

Polymer Formation

A drop of 5% in extraction efficiency at full load results in a loss of over 13 cwt. of 140° Tw acid/day. With regard to polymer formation, it is anticipated that still further improvement could be obtained by the provision of an entrainment separator immediately after the catch tanks and installation of a water-cooled flame trap to replace the existing crimped metal type.

Operating Costs. During the period when the vacuum carbonate plant was handling 15 mill. cu. ft./day coal gas load containing 430 gr./100 cu. ft. of H_2S, performance was equivalent to 103% of design; because of low extraction efficiency, however, the corresponding H_2S load to the acid plant was only 80% of design load. Operating costs on the two plants have proved particularly advantageous, it is reported, and compare favourably with the operating costs of the old oxide plant. (See table above). A value of £7 10s/ton for 140° Tw acid is considered reasonable value for the acid produced, but the market is a variable one.

Capital charges are not included in the comparisons made (see tables) as the size of the Beckton installation is not necessarily the optimum and information is still required on the life of the plant.

Remote Control System for Hydrochloric Acid

A METHOD for remotely controlling the transfer of concentrated hydrochloric acid in measured quantities from storage to process vessel has been designed by Liquid Systems Ltd., Holmethorpe Avenue, Redhill, Surrey, and incorporated in a large food works.

Storage tanks outside the factory building are elevated sufficiently to give gravity feed to the measuring vessels, which consist of calibrated, vertical cylinders, fitted with electronic level detectors coupled to the control system.

Movement of acid in the system is effected by compressed air, by way of specially designed pinch valves operated by H.P. air cylinders and servos. An electric, push button system controls the entire process automatically. When the measured charge has been admitted the valves shut and the measuring vessel is vented so that it is filled by gravity and available for the operation to be repeated.

In this installation two measuring vessels each feed a battery of eight process vessels with 250 gall. charges; the 16 process vessels are subsequently emptied by similar control methods. Over-riding direction of the whole process may be exercised from a remote programme control panel.

I.C.I. Appeal on Tax Relief Dismissed

IN the Chancery Division recently Mr. Justice Wynn-Parry dismissed, with costs, an appeal by Imperial Chemical Industries against the decision of Special Commissioners of Income Tax regarding relief to be allowed in assessing to United Kingdom tax dividends received by I.C.I. from their subsidiary, I.C.I. Australia and New Zealand, and taxed in Australia.

The dividends had to be assessed twice for U.K. tax, and I.C.I. contended that relief in respect of the Australian tax should be allowed in both assessments.

100 lb. of Rubber in the Modern U.S. Car

More than 100 lb. of rubber parts, excluding tyres and tubes, are now used on the average U.S. motor car, stated R. Malcolmson at a motor industry meeting sponsored recently in Coventry by Du Pont Co. (United Kingdom) Ltd. He listed design and engineering trends that would tend to affect the use of elastomeric products in future models.

Patents Delegation to Russia

The comptroller-general of the Patent Office, Gordon Grant, C.B., is leading a small delegation to Russia on 19 November to discuss the protection available in the U.S.S.R. for British inventions. He will be accompanied by William Wallace, assistant comptroller of the Industrial Property Department, and by H. R. Mathys, Fellow of the Chartered Institute of Patent Agents and a director of Courtaulds.

In Parliament

Government Bill to Regulate Use and Disposal of Radioactive Wastes

A BILL 'to regulate the keeping and use of radioactive material, and to make provision as to the disposal and accumulation of radioactive waste' has been formally presented to the House of Lords by Viscount Hailsham.

The Minister of Housing and Local Government has presented to the Commons a White Paper on the control of radioactive wastes. This contains the report of the panel on the Disposal of Radioactive Wastes, which makes proposals for legislation to provide for:

A central authority to be charged with the duty of ensuring that radioactive wastes are disposed of safely;
The notification of all deliveries of radioactive materials.
The prohibition of the use of radioactive materials except by registered users;
Authorisations to be obtained for discharges of radioactive wastes, which authorisations may be subject to conditions;
Powers to free minor uses and discharges from registration and authorisation respectively;
Powers to authorise methods of disposal and to withdraw registration where unsatisfactory methods are adopted;
The provision of waste disposal facilities;
Powers to enter and inspect premises to which radioactive materials are supplied;
Powers to sample and monitor radioactive wastes and the material contaminated when they are disposed of;
The removal of the radioactive content of wastes from the scope of any other powers.

Dangers of Arsenical Sprays

The case of a woman who apparently died as a result of drinking water contaminated by an arsenical potato spray mixture was discussed in a recent session in the House of Commons, after questions had been asked of the Minister of Agriculture, Fisheries and Food.

In reply it was stated that the recommendations of the Advisory Committee on Poisonous Substances used in Agriculture and Food Storage had been received, and were under discussion with the chemical and agricultural industries, and that a statement would be made very soon.

When the matter was further pressed from the floor, and the Minister was asked for an assurance that research into the use of these substances should not be held up by vested interests, he reiterated that the matter was under urgent survey and that a statement would be made as soon as possible.

Methane Gas Imports

Questioned about what plans have been prepared for construction of large liquid gas tankers for ferrying natural methane gas from America; what experiments have been made in importing this gas; if the Minister of Power is satisfied that adequate protection is being made for the men engaged in this operation; and what effect the importation of the gas will have upon U.K. natural resources, the Minister in a written answer says that until the Gas Council has completed trial shipments which began last February, it cannot put forward plans for imports on a commercial scale. Neither can the effect of such imports on indigenous resources yet be assessed. Transport and storage arrangements, for the trials, however, have been approved by the authorities concerned with safety.

Pyrethrum in Agriculture

In reply to a Member's question, the Minister of Agriculture said that pyrethrum had been shown so far to control only a small range of insect pests, particularly of the household variety. It was shortlived in effect and of relatively high cost. 'While it is less harmful than some insecticides,' the Minister stated, 'it is also, I am afraid, rather less useful against many types of insects.'

U.S. and Britain to Exchange Atomic Data

U.S. Atomic Energy Commission and U.K. Atomic Energy Authority have signed a five-year agreement to exchange technical information on advanced gas-cooled reactors, Lord Plowden and John A. McCone, chairman of the Authority and the Commission respectively, have announced.

Data will be exchanged on development, design, construction and operation, as well as on related research and development, of the advanced gas-cooled reactors being built at Windscale, England, and on the U.S. experimental reactor project of this type at the Oak Ridge (Tennessee) national laboratory.

Griffin and George Open New Branch

Two exhibitions demonstrating the resources of Griffin and George Ltd., Ealing Road, Alperton, Wembley, Middx, in the scientific instruments and research and development fields mark the opening of the firm's new branch in Newcastle upon Tyne on 17 November.

The business, founded by John Joseph Griffin (a founder member of the Chemical Society of London) 139 years ago, has long been in the forefront in service to laboratories of all kinds.

First of the two exhibitions, which show a representative range of equipment for education, research and development in industry, was staged at Newcastle upon Tyne from 17 to 20 November, while the second takes place from 23 to 25 November

Hedley's Research Spending

Thomas Hedley and Co. Ltd., the U.K. subsidiary of Procter and Gamble, U.S., spent £900,000 on research in the year ended 30 June.

"PESTICIDE MAKERS' PUBLICITY IS OF THE WRONG KIND"

THE pesticide industry was told on Monday evening that it did not indulge in publicity of the right kind to counter some of the ill-informed complaints made in connection with the use of toxic insecticides. Mr. F. C. Bawden, F.R.S., director of the Rothamsted Experimental Station, proposing the toast of 'The Pesticides Group,' Society of Chemical Industry, at the group annual dinner, said the industry deserved some blame because of its lack of publicity.

As a biologist he was strongly on the side of the pesticide manufacturers, but the industry was more concerned with sales publicity than in a general campaign designed to show "what good chaps you are and that you are not out to sterilise the whole population." It was the ignorant who were the scaremongers.

Members of the group were engaged in one of the most important industries, whose aim it was to ensure that the population did not starve. Once fertiliser manufacturers took first place in that objective, but now it was the insecticide industry that was most important.

Mr. Bawden thought that about half the world's output of foodstuffs was being lost to pests. Their industry should therefore have an enormous future because pesticides were still used on only a miserable proportion of the world's food.

He suggested there was a need for new kinds of pesticides, particularly against the menace of birds.

Replying to the toast, Dr. E. E. Turtle (Infestation Control Division, Ministry of Agriculture, Fisheries and Food), chairman of the group, spoke of members' dislike of the use of 'blanket sprays'—this he thought was a passing phase that was nearly over. Many pesticides were being developed that were designed for specific insects. Much work had been done on repellents, although as yet without much success. He felt that future pesticides would be even more selective.

The toast of 'The Guests' was proposed by Mr. G. L. Baldit (Plant Protection Ltd.), group vice-chairman, and replied to by Dr. W. Mitchell (chief chemist of Stafford Allen and Sons Ltd.).

Dounreay Reactor Becomes Critical

THE £7 million experimental fast breeder reactor of the Atomic Energy Authority which became critical on 14 November at Dounreay, will go through a phase of low power operation. This may be followed by a shutdown if modifications are found necessary before being worked up to full power.

Originally due for operation last year, start-up was delayed because of the redeployment of staff due to the Windscale pile accident and to certain design modifications.

The central reactor furnace comprises a core which is a hexagonal prism about 21 in. high and 21 in. across the flats. This is made up of about 360 enriched uranium rods in niobium cans and is surrounded by a further 2,000 rods of natural uranium, called the 'blanket'. The nuclear reaction in the core produces neutrons and heat; a proportion of the neutrons make their way into the blanket where they produce plutonium.

Plutonium is then used in the core to produce more heat and more plutonium. Experiments have shown that the amount of fissile material produced in the core and the blanket will exceed the amount burned up in the core. The neutrons are not slowed down and are therefore said to be 'fast'.

Heat removal is achieved by placing the whole of the core and blanket in a stainless steel vessel filled with a liquid metal coolant, sodium-potassium alloy. This is circulated by electromagnetic pumps through the vessel and through 24 heat exchangers arranged radially round the vessel.

It is hoped to use the experience gained at Dounreay to design a prototype fast breeder reactor. One of the problems to be solved is to simplify the cooling system without loss of safety to make it more feasible from the commercial point of view.

Fleck on I.C.I.'s Profit Sharing Scheme

Sir Alexander Fleck, chairman, Imperial Chemical Industries Ltd., speaking in London to the Industrial Co-partnership Association, of which he is the new president, said that in the five years of I.C.I.'s profit-sharing scheme, the average employee would have been given £100 worth of stock. If the employee had retained this stock to the present day, it would be valued on the Stock Exchange at £275.

About 60% of the stock that had been handed out, had been retained in the hands of the original recipients.

Fall in U.K. Production of Gas By-Products

Production of crude benzole by the gas industry for the three months ended June 1959 was 5.7 million gall., against 6.1 million gall. for the same period during 1958, a reduction of 6.6%. The figures are given in the industry's statistical information issued for November, and crude tar and coke production are depicted. For the three months ended June 1959, crude tar produced by the industry totalled 408 thousand tons, a reduction of 6.6% below the figure for the same three months of a year earlier.

New Catalyst for Low Pressure Process Polythene

AT THE International Union of Pure and Applied Chemistry's symposium on macromolecular chemistry in Wiesbaden, Germany, Dr. Siegfried Nitzsche, of Wacker-Chemie, Gurghausen, Germany, described a new catalyst for low pressure process polythene. The catalyst, which contains siloxane and reduced titanium is a reddish-brown precipitate formed with methyl hydrogen siloxane and titanium tetrachloride in the presence of a trace of alcohol.

This new catalyst is stated by Dr. Nitzsche to have the following advantages: pressure need only be slightly above atmospheric; polymers can be prepared with different molecular weights, and greater heat and light stability than present low pressure process polythenes.

Water-soluble Lubricant for Man-made Fibres

RECENTLY placed on the market by the Dyestuffs Division of I.C.I., is Cirrasol HA, a textile processing assistant, whose properties are fully described in the division's Auxiliary Products Pamphlet No. 123. It is a carding and spinning lubricant for rayon, polyamide, polyester and acrylic fibres, and has an antistatic effect on all textile fibres. The product is water-soluble in both hard and soft water and is substantive to all the above fibres, as well as to wool and cotton. Tests with a wide range of direct, acid and disperse dyes have shown that Cirrasol HA has insignificant effect on the shade and light fastness of these dyes.

Spending on Pharmaceutical Research Doubled

Last year in their U.K. research establishments, members of the British Association of Pharmaceutical Industry spent £5,053,146 on the development and discovery of new drugs, nearly double the 1953 figure. Many U.K. subsidiaries of foreign companies have also been able to call on the research resources of their overseas associates.

New Headquarters Planned for British Oxygen Co.

British Oxygen Co. Ltd. have completed arrangements to lease a large modern office building for their head office near Hammersmith. Construction will start almost immediately and it is expected that the move from the present premises in St. James's will take place in two or three years time.

Argon Chromatographs for Russia

Russia has placed a contract with W. G. Pye Ltd., one of the Pye Group of Companies, for nine argon chromatographs worth about £7,000, deliveries of which will be completed in the near future.

Overseas News

SPANISH PHARMACEUTICAL SALES CONTINUE AT HIGH LEVEL SAYS B.o.T. REPORT

TOTAL annual sales of pharmaceutical products in Spain, greatly increased in recent years, are currently estimated at about 3,000 million pesetas, of which at least 40% is for antibiotics, for which extended State and co-operative medical services are largely responsible.

This trend, states the Export Services Branch of B.o.T., is likely to continue; and it is noticeable that a high proportion of foreign firms have taken the opportunity to arrange with Spanish manufacturers to have their products made under licence, though the number of U.K. firms to have done this is reported to be small.

The U.S. are strongly represented by Lilly, Parke Davis, Pfizer, Shenley, Squibb, etc. France by Astier, Rhone Poulenc, Specia, Midy, etc. Holland by Duphar, Organon, Vitapharm, etc. Denmark by Leo, Cid, Novo, etc.. and Italy by Baldacci, Bruschettini, Erba, etc. Antibiotics which now account for so large a proportion of pharmaceutical sales are made by three Spanish firms; Antibioticos S.A. of Leon in collaboration with U.S. Schenley; Cia Espanola de Penicilina y Antibiotics S.A., of Aranjuex in collaboration with U.S. Merck; and Farmabion S.A. of Madrid in collaboration with Leo and Co., Copenhagen. The industry claims to meet national needs in antibiotics with few exceptions.

The report, which is comprehensive, describes the conditions of sale of such products in the Spanish market, lists prevalent diseases, and provides details of exchange restrictions and commercial travellers' licences. In conclusion it sets out comparative values of exports to the market from the U.K.'s four leading competitors, based on figures for 1957, while provisional figures are given for 1958.

Franco-German 460-mile Pipeline Authorised

The French Government has given its official permission for an oil pipeline to be laid for Lavera, near Marseilles, to Strasbourg (France) and Carlsruhe (West Germany). The line, which will be some 460 miles long, will feed crude oil—mainly of Saharan origin—to two French refineries and oil processing plants near Strasbourg and a refinery near Carlsruhe. Operation of the pipeline will start on 1 January 1963 at the latest. It will be owned and operated by the consortium Société du Pipeline Sud-Européen. The following oil and petrochemical companies have an interest in this company: Compagnie Française des Pétroles, Compagnie Française de Raffinage, Purifina Française, Société Française des Petroles BP, Antar-Pétroles de l'Atlantique, Compagnie de Raffinage Shell-Berre, Caltex S.A.F., and Mobil Oil Française (French); British Petroleum Co. (British); Bataafsche Petroleum Mij. (Dutch); Standard Oil of New Jersey (U.S.); Deutsche Erdöl AG, Gelsenberg Benzin AG, Mobil Oil AG in Deutschland, Scholven Chemie AG, and Wintershall AG (Germany).

Costa Rica Plans Fertiliser Plant

A fertiliser factory is planned for Costa Rica that will cost US $7 million and produce 440 tons a day. Participating in the project will be the International Development and Investment Co.; the Chemical and Industrial Corporation of Cincinnati, which specialises in the design and construction of plants for the manufacture of ammonia in different forms; and Phoenix-Rheinrohr of Düsseldorf, one of the biggest steel producers in Europe, with interests in various other countries, which will supply the machinery for the plant.

Du Pont (Canada) Boost Nylon Chemicals Production

A $400,000 expansion of facilities for the production of nylon chemicals at its Maitland, Ontario, works has been announced by Du Pont of Canada Ltd. The expansion will bring the Maitland plant's production of these basic materials to the level required by the company's Kingston nylon plant, where a $600,000 expansion in textile yarn facilities was recently carried out.

Hooker Chemical to Establish N.Y. H.Q.

Hooker Chemical Corporation have decided to establish corporate headquarters in New York City some months hence, the decision involving only some 15 to 20 people in certain corporate departments out of approximately 461 corporate personnel, and a total of about 2,550 employed by the firm at Niagara Falls. The new address will be 666 Fifth Avenue, New York City, N.Y.

Chemical Specialisation in Comecon Countries

Comecon, the Eastern European economic co-operation organisation, states that up to last year, the Soviet Union had built 35 chemical combines and five mineral oil-processing plants in the neighbour countries of the pact. Plans for specialisation in the chemical as well as in general industrial fields are to continue.

Among the chemical items in which East Germany is to specialise are polyacrylonitrile (PAN) fibres, potash fertilisers, p.v.c., ion exchange resins, silicones, synthetic rubber based on butadiene-styrene, nitrile and silicone bases and various synthetic fibres. It will benefit by the specialisation of other Comecon countries (primarily Poland and Czechoslovakia) in such items as synthetic rubbers from chloroprene-isoprene, thiokole and fluorine bases, phosphorus-containing raw materials and acetate fibres.

Czechoslovakia, Poland and East Germany are to concentrate on the planning of carbide plants and East Germany and Czechoslovakia will specialise in plant for the manufacture of p.v.c. and polystyrene.

Canadian Fertiliser Expansion

Rainbow Chemicals Ltd., Ontario, primarily bulk liquid fertiliser manufacturers and claiming to have the only plant of its kind in Canada, are undertaking a major expansion programme involving new office facilities, new storage tanks, and improved plant process facilities.

Capacity increase has been arranged by redesigning and enlarging original process facilities, and removal of the present office from the main building will allow more space for raw material storage, while new pumping equipment is being installed to give faster and improved loading facilities.

Swiss-Italian Joint Plant for Antibiotics

Work is reported to have begun at Torre Annunziata, near Naples, on the building of a plant for the production of antibiotics and fermentation products, to be operated by the new Italian company, Fermentazioni Vesuviane di Torre Annunziata (Fervet). The company is a joint 50-50 subsidiary of the Swiss company of Ciba AG., Basle, and the Lepetit concern of Milan. The site is near that of the two Lepetit plants, Antibiotici Lepetit and Dowe Lepetit.

Brazil Cellulose Plant Proposed

The International Finance Corporation is, together with other interests, to invest a total of $4 million in the Brazilian cellulose firm Champion Celulose S.A. for the erection and operation of a sulphate cellulose plant.

U.S. Caustic-Chlorine Expansion

Chemicals Division of Olin Mathieson Chemical Corporation is planning further to expand its electrolytic caustic chlorine plant at McIntosh, Ala. The initial installation was made at McIntosh in 1952, and the plant was doubled by addition of a second unit completed early in 1957. It is proposed to add a new cell bank to the two already installed, the projected expansion being to meet needs

Benzylamine Now Available from Robinson Brothers

NOW in commercial production by Robinson Brothers Ltd., Ryders Green, West Bromwich, are benzylamine and dibenzylamine.

A base of about the same strength as ammonia, benzylamine behaves as an aliphatic amine. The C-N bond is the weakest bond in the molecule and some of the reactions and uses of benzylamine are based on the rupture of the C-N bond. In contrast to dibenzylamine, it absorbs carbon dixoide from the air with carbamate formation. Benzylamine easily forms salts with acids and is a very convenient reagent to identify fatty acids and nitrophenols as most of these salts are insoluble in ethanol and/or benzene.

Benzylamine has a wide variety of uses in syntheses. It also has various catalytic uses and has been shown to be the best catalyst in the preparation of *cis-trans* enol glycosides of methyl acetoacetate from the fully acetylated glycosides. It has also been used as a catalyst in the condensation of ethyl cyanoacetate and various ketones either by itself or to act as a 'promoter' for the use of piperidine as a catalyst.

Use as Pesticides

Compounds of benzylamine have been suggested as pesticides. Both benzylammonium benzyl dithiocarbamate and diethylammonium benzyl dithiocarbamate have been found effective against the fungus *Paramecium caudatum*. The benzylamine salt of 2,4-dinitro 6-methyl phenol, 2,4-dinitro 6-phenylphenol and 2,4-dinitro 6-cyclohexyl phenol are miticides, being active against red spider, while benzylammonium thiocyanate has been suggested as a rat, insect, etc., repellent. N-Benzyl-α-chloropropionamide has been used as an anticonvulsant under the name Hibicon. Other uses are: as an antioxidant for soap, in polymer formation, and for stabilising antibiotics.

Dibenzylamine behaves as a secondary aliphatic amine, but is different from benzylamine in several respects. For instance, it is a much weaker base and it does not absorb CO_2 from the air. It is unstable to heat. The benzene rings cannot be hydrogenated, nor does decomposition take place. Several salts have been made. With some salts, dibenzylamine forms two salts, one being normal, the other containing two equivalents of acid per equivalent of base. (The chloride, monoacetate and diacetate are available from Robinson Brothers as well.)

Uses of dibenzylamine are varied. It and its compounds have been used in rubber vulcanisation. Dibenzylammonium dibenzyldithiocarbamate is used as an accelerator for golf-ball manufacture. Zinc dibenzyldithiocarbamate is a non-staining, non-discolouring ultra accelerator suitable for use in dry rubber, latex and rubber cements. A quick-curing room temperature curing system for neoprene cements (containing between 85 and 93 parts of neoprene GN) is said to be 8 to 12% by weight per 100 parts of cement of a mixture of 1 volume dibenzylamine and 3 volumes carbon disulphide. Dibenzylamine has also been used as an anti-scorching agent for butyl and other rubbers where the p-quinone dioxime—red lead accelerator system is used.

Penicillin has been used in the form of its penicillin salt, prepared from penicillin and dibenzylammonium chloride. Dibenzylamine has been added to slushing oils to prevent the rusting of iron, while dibenzylammonium dibenzyldithiocarbamate is said to be highly effective as a bacteriostatic agent on both gram-negative and gram-positive bacteria.

Use of Tantalum as Catalyst in Preparation of Synthetic Diamonds

FIRST detailed account of how the General Electric Research Laboratory, Schenectady, New York, U.S., makes diamonds from graphite or carbon black, has now been published (*Nature*, 1959, **184**, 1094, 10 October). General Electric are now making industrial diamonds at an annual rate of about 3½ million carats, or about 40 million to 50 million stones worth £3 million a year. The company claim on average a 35% better performance when used for grinding or other similar purposes, at a cost of 21s a carat, or 1s a carat higher than the price of ordinary mined diamond. Cost is expected to fall to about 18s or 19s per carat by 1961.

The G.E. process not only enables use to be made of a series of common raw materials including commercial graphite and carbon black, but also enables the colour of the diamonds produced to be precisely controlled by varying temperature and pressure and also the shape to be varied. The ability to vary the shape of the final product at will is the reason for the better performance of these man-made diamonds in industrial applications over natural diamond. It is also revealed that the process of manufacture could be developed to produce diamonds larger than the present production maximum of one-tenth of a carat (or 1/16th in. in diameter) and of a quality suitable for use as gem stones.

In their work Drs. H. P. Bovenkerk, F. P. Bundy, H. T. Hall, H. M. Strong and R. H. Wentorf Jr., performed a number of experiments using a metallic catalyst and carbonaceous material. In one of these iron-rich iron sulphide together with carbon and tantalum, was heated at about 1,600°C at about 95,000 atm. After a heating time of ten minutes, on the tantalum discs, tantalum carbide had formed, and on top of this lay a black crusty layer of small diamond crystals. This experiment was repeated "many times".

Other substances have been found to be effective as catalysts for conversion of carbon into diamond at pressures ranging from 55,000 to 100,000 atm. and temperatures ranging from 1,200 to 2,400°C. These are chromium, manganese, cobalt, nickel, palladium, platinum, etc., or compounds which react to give the free metals, e.g. nickel oxide, ferric chloride, etc.

General Electric use a container of a special ceramic, pyrophyllite (naturally occurring form of aluminium silicate) enclosed inside a special assembly of units made from the same material. Also inside the container assembly is a small quantity of metal catalyst (usually tantalum). Pressure is gradually exerted at both ends of the assembly until the desired pressure is reached. Simultaneously electric current is passed to the inner container to heat the graphite and metal to the required temperature.

Conditions for Diamond Formation. G.E. have listed some of the conditions peculiar to formation of diamond. These are as follows: Pressure and temperature of the system should be those for which diamond is thermodynamically stable. The temperature must be high enough to ensure that the catalyst metal saturated with carbon is molten. The catalyst metal can be Ca, Mn, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir or Pt. Tantalum however, is stated to be particularly effective for inducing small diamond crystals.

New diamonds can form whether diamond seed crystals are present or not. As synthesis pressure and temperature are moved further into the diamond-stable region away from the graphite-diamond equilibrium line, the rate of nucleation and growth of diamonds increases and their average crystal-size decreases. The diamond can grow at a rate of at least 0.1 mm. per min.

Diamonds easily include or grow around foreign particles present in the mixture. Some of the catalyst metal may thus be trapped in the diamond crystal. Bovenkerke *et al.* also report that diamond crystal habit varies according to the temperature of formation, cubes predominating at the lowest temperatures, mixed cubes, cubo-octahedra and dodecahedra at intermediate temperatures and octahedra at the highest temperatures. No tetrahedra have been found. Colour varies from black at low temperatures through dark green light and yellow, to white at the highest temperatures. Green and yellow colours seem to be associated with imperfections in the diamond crystal latice, rather than with the presence of specific impurity.

RECOVERY OF LOST SO_2 FROM CONTACT SULPHURIC PLANTS DESCRIBED AT STOCKHOLM

NORMAL losses of sulphur dioxide from contact sulphuric acid plants are in combination with the substances leaving the plant. If the acid product which contains only small amounts of SO_2 is eliminated, only the gaseous effluent from the absorption towers is left. The concentration of SO_2 in the effluent is found to range from 0.12 to 0.3% of the total volume, i.e., from 2% to 5% of the SO_2 leaving the washtower.

Advances in the preparation of vanadium catalysts and conversion unit equipment have been such that it is possible to attain a stable conversion rate of 98% with pyrites gases so that further improvement could only involve uneconomic use of catalyst and power. Efforts have therefore been concentrated on SO_2 loss due to solubility of SO_2 in sulphuric acid circulating in the drying towers.

Gas Drying Systems

The two chief gas drying systems are the combined circulation system and the separate circulation system. At first sight, reported T. Cesca of Montecatini at the recent Stockholm meeting of the International Superphosphate Manufacturers' Association, the combined circulation system appears the more attractive because of its simplicity and because it can supply a more concentrated acid to the drying tower. In favour of the separate circulation system, however, is that H_2SO_4, even at high strength will dissolve SO_2, and, in the drying tower the gases have a partial pressure of SO_2 very much higher than those in the absorption tower (0.06 as against 0.0015 kg./cm.^{2}). In the absorption tower, the SO_2-rich acid will release SO_2 in gas form and the SO_2 will be lost. This loss is proportional to the amount of acid exchanged between the drying tower cycle and the absorption tower cycle, and is thus substantially higher where the system is combined than when the cycles are separate.

Cesca works out the SO_2 loss for each kg. of acid produced using the combined circulation system at 2.4%. In the case of separate circulation systems, he has evolved an equation $0.107 \times F/[1/C - (1/0.085)]\%$, where 'F' is the weight of water vapour contained in the volume of gas at 6% of SO_2 needed to make 1 kg. H_2SO_4 and 'C' the concentration of the acid. Using this equation and taking into account the values of 'F' derived from the values of the water vapour pressure of the 15° Be' acid at temperatures between 15 and 39.4°C loss of SO_2 as % of output has been worked out, covering all cases which might arise in practice.

It is stressed that changeover from combined to separate circulation systems reduces SO_2 losses from 2.4% to a level which, in practice, can easily be held at about 0.5%, when working with the gases at 32°C and the drying tower acid at 96% H_2SO_4. Loss can be still further reduced, it is claimed, (a) by reducing the temperature of the gases coming from the washtower; such an arrangement is not generally feasible as it requires extensive and therefore costly cooling surfaces; and (b) by lowering the concentration of acid circulating in the drying tower, but this would cause a deterioration in drying conditions of the sulphurous gases.

Montecatini workers therefore had the idea of inserting in the flowline of the acid transferred from the drying to the absorption tower a device to extract SO_2 content of the acid and recycle this SO_2 back to the drying tower. This was the origin of the gas extraction tower.

De-Gassing Tower System. The gas extraction tower system is now used in Montecatini's plants, both new and old. The tower is small and packed with Raschig rings through which the acid is passed from top to bottom to remove the SO_2, while air is blown counter-current, and subsequently passes to the drying tower.

Concentration of the gases leaving the battery of furnaces never falls below 7% and sometimes reaches 8%, while the gases must not be passed to the converters with a SO_2 content above 6.2%. By using the de-gassing tower system it has proved possible to eliminate SO_2 loss due to solubility of this gas in H_2SO_4, while raising acid concentration from 97 to 97.5%.

Method for High SO_2 Concentration. The idea of extracting the SO_2 content of the acid has led to a further development in contact sulphuric acid plants equipped with fluidised bed roasters. This method of roasting produces sulphurous gases with a high SO_2 concentration (about 13%) which have to be diluted to 6 to 6.5% for the converters.

It was decided to have three towers: the absorption tower, through which the gases leaving the converters would pass; the drying tower, through which gases containing 13% SO_2 would pass; and the gas extraction tower, through which would pass an equal volume of air to give a final mixture containing 6.5% SO_2. The gas extraction and drying towers would thus be equal in size and half the size of the absorption tower.

Acid leaving the absorption tower is divided into two equal parts. The first part is combined with acid leaving the gas extraction tower and from there is sent to the top of the absorption tower; the second is mixed with acid leaving the drying tower and passed to the top of the drying tower (50%) and the gas extraction tower (50%).

Advantages Claimed. Acid circulating in the drying and gas extraction towers (which also acts as drying agent) always has a concentration of 98%. Acid passed to the absorption tower always has SO_2 extracted because it comes partly from the gas extraction tower and partly from the absorption tower. There is no need to adjust the differences between one circulation and the other as the level is the same in the two vessels which are connected with each other.

Vacuum Science Committee Formed

FOLLOWING the Institute of Physics' London conference on high vacua held in April last, various suggestions were made for arranging regular British meetings on vacuum science and technology, and for British participation in international conferences in this field.

As a result of informal discussions between societies and institutes in this country a 'Joint British Committee for Vacuum Science and Technology' has now been formed. The committee consists of representatives from a number of bodies, including the Institute of Biology, the Institution of Chemical Engineers, and the Royal Institute of Chemistry.

Its objects are to co-ordinate and help to initiate meetings in the whole field of vacuum science and technology arranged by constituent bodies and to act in the collective interest of the constituent bodies.

The Institute of Physics has agreed to provide the secretariat for the joint committee. Communications should be addressed to the secretary of the joint British committee at its headquarters 47 Belgrave Square, London S.W.1.

'Rigidex—the Polyethylene Plus'

HUNDREDS of uses in home and industry for high density polythene are described in 'Rigidex—the polyethylene plus,' a new booklet published by British Resin Products Ltd., Devonshire House, Piccadilly, London W.1. The booklet shows how the properties of the new rigid material are extending manufacture in plastics.

Rigidity, and corrosion and solvent resistance of Rigidex are important in many applications and sheet stiffness has made it useful in the fabrication of chemical plant, where it can be used for fume ducting, tank linings and panellings for cooling towers.

Low permeability and rigidity combine to enable thinner wall thicknesses to be achieved for bottle blowing; Rigidex can also be steam-sterilised.

Ropes, cordage and fishing nets that are unaffected by moisture, oil and grease are now also being made from this product, while the non-stick qualities of fabrics made from it are of interest to the food industry.

of customers in the mid-south, particularly the rayon and the pulp and paper industries, and it should accommodate these needs for the foreseeable future. In addition to caustic and chlorine the McIntosh plant manufactures various insecticide products.

Nitrogen Factory for Rhodesia ?

The possibility of establishing a £9 million nitrogen factory near Salisbury, Southern Rhodesia, is reported to have been discussed between representatives of the Federal Government and African Explosives and Chemical Industries (Rhodesia) Ltd. The factory would manufacture nitrogenous fertilisers for the Federation of Rhodesia and Nyasaland.

Alberta Pacific Plan New Sulphur Plant

Alberta Pacific Sulphur Co. are planning to build a $10 million to $12 million sulphur recovery plant in the Panther River area of Alberta's foothills belt, about 40 miles north-west of Calgary.

If the present negotiations with Union Oil of California and Canadian Homestead Oils are successful it will probably be the world's largest plant engaged in the extraction of elemental sulphur from raw natural gas.

Union Oil and Canadian Homestead own petroleum and sulphur rights to 36,850 acres in the Panther River area, where one well has been drilled to 8,000 ft. and will be deepened to 10,000 feet to top the sulphur bearing horizon. Shell of Canada have a well less than two miles west of the Union-Canadian homestead acreage, which has indicated substantial reserves of hydrogen sulphide gas. However, it is reported that Shell have no plans to enter the sulphur business from production on their acreage.

Alberta Pacific Sulphur are arranging for the marketing of 350,000 tons of sulphur annually to Europe, the Far East, and India. Eventually the company hopes to match from Panther River the entire sulphur production from natural gas in the U.S. and Canada which last year amounted to about ¼ million tons.

Italian Sulphur Stocks

By 1 September of the current year, stocks of raw sulphur stored at the warehouses of E.Z.I. (Italian Sulphur Board) increased to 233,734 tons.

New Montecatini Fertiliser Plant in Sicily

The chemical fertilisers plant which the Montecatini group has built at Castelfranco, Sicily will utilise a bed consisting of alternate layers of rock salt and potassium salts discovered at Bosco near Serradifalco.

The capacity of this plant totals about 150,000 tons a year and the processes which it will use are wholly new, having been specially worked out at the Guido Donegani Research Institute, Novara. Several difficulties had to be overcome in the building of this plant, not the least being the shortage of water, overcome by constructing an artificial lake with a capacity of one million cu. m. Additionally, an 11-mile ropeway with a capacity of 150 tons an hour has been built to link the plant with the mineral bed.

Taiwan Increases Nitrogen Phosphate Production

The Taiwan Fertiliser Corporation have obtained a loan of $200,000 (U.S.) towards the cost of increasing nitrogen phosphate production of one of their factories to 150,000 tons a year, and tenders are to be invited for procurement of machinery and equipment.

The big Far Eastern urea fertiliser plant at Nanking in suburban Taipei was scheduled in October to commence production of some 84,000 tons per annum of urea crystals—one-third of Formosa's annual fertiliser requirements.

West German Export Cartel for Acetates

An export cartel has been registered by German manufacturers at the Federal Cartel Office for acetate materials. The cartel provides for the common furtherance of export sales of pure acetate yarns and such cloths and manufactured piece goods as are made from 100 per cent cellulose-basis chemical fibre. The cartel is represented by the Franco-German fibre manufacturer Deutsche Rhodiaceta AG, Freiburg-in-Breisgau.

Unilever's Joint Venture With Emery Industries

A new company, to be known as Unilever Emery N.V., will be founded jointly by Unilever N.V., of Rotterdam, and Emery Industries Inc., of Cincinnati, a leading oleo-chemical concern.

A plant in the Netherlands will be built by the new company for the manufacture of raw and auxiliary chemical materials for several industries. It will be constructed near an existing chemical factory, the Gouda-Apollo factory at Gouda, which will be able to provide raw materials.

Unilever are to take over the entire Gouda-Apollo stearine candle and chemical fats plant. They have already announced a bid for this company's shares on the basis of Fls.800 worth (nominal value) of Unilever Ordinary shares. The offer is open until 4 December. The board of Gouda-Apollo has advised shareholders to accept the bid.

Israel Phosphate Exports

Exports of Israel phosphates will, it is estimated, total 100,000 tons during the current fiscal year, and bring in $800,000—according to Minister of Development, Mordecai Bentov (40,000 tons of phosphates had been expected during the previous year).

Bentov said such progress had been made at the Phosphates Works at Oron that the company has managed to cover all its costs during the past half year, including interest payments and provision for amortisation and additional investment in the plant. A new flotation plant would be brought into operation to raise the phosphorus pentoxide content of the phosphates there from 28 to 31%. He also said that preliminary tests in the Ein Yahav area, about 70 miles north of Eilat, had shown that that region could provide about 100,000 tons of phosphate a year. It had the added advantage of being much closer to Eilat harbour and the Oron region. In respect of the Dead Sea Potash Works, Bentov revealed that a plan prepared by the Zanzibar Co. in the U.S. for the expansion of the plant's annual output capacity to 600,000 tons had been completed. The plant now had a capacity of 135,000 tons, but expansion plans would need an investment of I£50 million, and three years to complete.

Pure Scandium in Experimental Quantities

AVAILABLE in experimental quantities from St. Eloi Corporation, Cincinnati, Ohio, is 99% pure scandium. A white metal with a faint pink tinge, scandium is one of the transition elements. It is obtained from thortveitite, a mineral containing about 37.6 to 42% scandium oxide. Melting point of scandium is between 1,550° and 1,600°C.

From thortveitite, St. Eloi extract 99+% pure oxide by ion exchange, to make the pure metal a reduction-distillation technique is used. Scandium oxide is dry-fluorinated to give scandium fluoride. This fluoride is then mixed with a 10% excess of distilled calcium, then reduced in a welded tantalum crucible at about 1,400°C under argon at near-atmospheric pressure. To separate the metal from the slag, the temperature is raised to 1,650°C. The scandium ingot can pick up at this stage from 3% to more than 12% tantalum from the crucible depending on the length of time the metal stays molten and its temperature.

Removal of the ingot for distillation is accomplished using a specially-designed container consisting of a heavy-walled tantalum crucible fitted with a copper water jacket which is capped with a distillation assembly. The inner part of the assembly is made of copper; the outer of stainless steel. Teflon 'O' rings are used to seal the container and water or air to cool the distillation assembly. The container is then evacuated to 0.1 micron and heated to 1,600°. The scandium begins to distil at 1,550° and is completely distilled at 1,750°C.

Scandium distillate contains about 1% calcium, St. Eloi report, so this is removed by arc melting leaving an ingot containing over 99% pure scandium with a very little tantalum.

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PEOPLE in the news

● Two overseas guests at the annual dinner on Tuesday of the Pesticides Group, Society of Chemical Industry, attended as guests of **Dr. T. F. West,** European operations executive of the African Pyrethrum Technical Information Centre. They were **Professor Dr. F. P. Kuenen,** Professor of Entomology at Leijden University, Holland, and **Dr. Ing. J. E. Heesterman,** head of the chemical and biological laboratories at the Royal Institute of Tropics, Amsterdam. They also took part in the symposium on pyrethrum held earlier in the day.

● **Dr. C. M. Johnson** has been appointed director of the Explosives Research and Development Establishment at Waltham Abbey, announce the Ministry of Aviation. Dr. Johnson, who is 55, went to the establishment in 1948 and since 1954 has been director of the Materials and Explosives Research and Development Branch.

● **Mr. L. E. Whitmore** has been appointed director and general manager, Polyethylene Division, Union Carbide Ltd., 103 Mount Street, London W.1, with responsibility for marketing, manufacture and all other aspects of U.C. activity in this field. **Mr. J. F. Widman,** previously director of marketing, chemicals, becomes director and general

L. E. Whitmore

J. F. Widman

manager, Chemicals Division. He will be responsible not only for the manufacture and sale of products from the new plant at Hythe but also for continued development of the market for imported chemicals. **Mr. R. Wilson** has been appointed a director of the firm and becomes director and general manager, Alloys Division.

● **Mr. A. F. McDonald,** director and secretary of the Distillers Company, has been appointed a member of the management committee, and relinquishes the office of secretary. **Mr. J. A. Bennett** succeeds him as secretary.

● Following the election of **Mr. Hubert A. Oughton** (chairman of W. S. Crawford Ltd., advertising agents) as president of the Advertising Association, **Mr. Glanvill Benn** (chairman of Benn Brothers Ltd., publishers of CHEMICAL AGE) has succeeded him as hon. treasurer of the association. Mr. Benn has been chairman of the finance committee since 1954.

● **Dr. G. G. Haselden, Ph.D., B.Sc.Eng., D.I.C., A.M.I.Chem.E.,** whose appointment to the Brotherton Chair of Chemical Engineering at Leeds University was announced in the 31 October issue of this journal, is aged 35, and graduated in chemical engineering in 1944 at the Imperial College of Science and Technology. He started research under the late Sir Alfred Egerton on problems connected with the liquefaction of methane and on results of this work was awarded his Ph.D. During the period 1946-48 he served on the staff of the Gas Research Board and subsequently came on to the staff of the Imperial College to fill a newly created lectureship in low-temperature technology, where he became senior lecturer in 1957. His main fields of interest have been in the liquefaction of natural gases, development of more efficient low-temperature gas separating processes, refrigeration plant for use in the chemical industry, and measurement and correlation of the thermodynamic properties of mixtures. He has invented a number of new low-temperature cycles and items of plant, some of which latter are now being exploited by industry.

Dr. Haselden

G. C. Devereux

● **Mr. G. C. Devereux,** manager of the Technical and Development Divisions of H. J. Elliott Ltd., E-MIL Works, Treforest Industrial Estate, South Wales, manufacturers of volumetric glassware and thermometers, will have been with the company 41 years in December. Last year, his fortieth anniversary of service in the company, was marked by a presentation. Recently, as a member of the U.K. delegation, he has been attending the International Standards Organisation meetings on laboratory glassware and related apparatus in London.

● **Mr. H. Gosling,** of Cornbrook Chemical Co. Ltd., was elected chairman of the British Colour Makers' Association at the annual general meeting held on 4 November, when the other officers chosen were **A. K. Ames,** Imperial Chemical Industries Ltd., vice-chairman; **Sir Christopher Cowan,** Cowan Bros. (Stratford) Ltd., hon. treasurer. The following were elected to the council: **C. M. Beavis,** Golden Valley Colours Ltd.; **G. E. Hillier,** J. W. and T. A. Smith Ltd.; **H. Gosling,** Cornbrook Chemicals Co. Ltd.; **J. H. Grimshaw,** Horace Cory and Co. Ltd.; **H. Pike,** Hull and Liverpool Red Oxide Co. Ltd.; **V. Watson,** Cromford Colour Co. Ltd.; and **A. H. Whitaker,** James Anderson and Co. (Colours) Ltd.

● **Mr. C. J. Beavis** has been appointed by Birlec-Efco (Melting) Ltd. to take charge of all Birlefco's smelting activities. Formerly works engineer for the Distillers Co. Ltd. at their factory near Port Talbot in South Wales, Mr. Beavis was responsible for all engineering construction and maintenance required for the production of calcium carbide.

C. J. Beavis

Dr. F. E. King

● **Dr. F. E. King, F.R.S., D.Phil., D.Sc., Ph.D.,** has joined the refineries and technical department of the British Petroleum Co. as scientific adviser. Dr. King recently resigned from the board of British Celanese Ltd., where he had been director in charge of research since 1955. Educated at London University and Oriel College, Oxford, he became a Ramsay Memorial Fellow in 1930/31 and took up a post as demonstrator in Dyson Perrins Laboratory, where he remained until 1934. From that date until 1948 he held university posts as lecturer and demonstrator in chemistry.

● **Mr. A. S. D. Barratt,** technical director of Edwards High Vacuum Ltd., Manor Royal, Crawley, is resigning from the board at the end of the year. He has been appointed technical consultant to the company.

● **Mr. Monroe Maller,** who has been appointed European operations manager of Texas Instruments Ltd., is responsible for all aspects of the sales organisation handling semi-conductor devices throughout West Europe, except the U.K. He will operate from the U.K. headquarters at Dallas Road, Bedford.

● **Mr. John C. Weyrich** has been appointed manager of the Du Pont (United Kingdom) Ltd.'s Maydown Works at Londonderry, N. Ireland, where neoprene will be manufactured. He joined Du Pont in 1941 as a chemical engineer.

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CRAYFORD · GLASGOW · BRISTOL · BELFAST · PLYMOUTH

Commercial News

- **Substantial Profit Increase for ABRAC**
- **Nat. Plastics Accept Courtaulds Offer**
- **7.5% More Sales by Montecatini**
- **Chemical Industry Mainstay of Eurunion**

British Benzol

Henry Briggs Son and Co. (Trust) have gained control of British Benzol and Coal Distillation.

As a result Mr. G. Edwards, Major-General A. H. Gatehouse and Brigadier W. Brookes have joined the Benzol board and Mr. G. H. Johnson, Mr. R. W. Rutledge and Mr. M. Richards have resigned.

Boake Roberts

A. Boake Roberts and Co. (Holding), chemical manufacturers, are raising their interim from 5% to 7½% for the year to end-March 1960, and announce a one-for-three scrip issue proposal.

Group profit, before tax, increased to £177,600 for the six months to 27 September last, from £43,500 for the corresponding 1958 period. The substantial improvement is attributed to increased sales, a reduction in expenses, and the higher rate of production and better efficiencies at the Widnes plant.

Unless there is any adverse change in trading conditions during the second half of the financial year, the directors expect to pay a final dividend equivalent to 12½% on the present equity capital, making a total of 20% (15%).

The scrip issue, capitalising £158,333 from general reserve, will be made to holders registered 4 December. It is proposed to increase the authorised ordinary capital from £600,000 to £1.5 million.

Courtaulds

Société Courtaulds France, the French subsidiary of the U.K. synthetic fibre manufacturer, Courtaulds Ltd., is to become a public company and take up the production of the Courtauld fibre 'Courtelle'. A group of French wool industry interests will associate themselves with the converted company through the French concern Peignage Amedée Prouvost. The firm, with technical aid from the British company, will open a production plant at Pont-du-Leu near the synthetic textiles plant of Société Les Filés de Calais not far from Calais, where production is expected to begin early in 1961.

National Plastics

Baring Brothers and Co. announces that their offer on behalf of Group Developments, a subsidiary of Courtaulds Ltd., to acquire the issued ordinary capital of National Plastics, has received more than 90% acceptance and is now unconditional. Baring Brothers will continue to receive acceptances. In due course steps will be taken to acquire compulsorarily, subject to provisions of the Companies Act, 1948, any balance of stock not lodged for acceptance.

Unilever Interim Dividend

Unilever have declared an interim dividend of 1s 7.2d per £1 ordinary, or 8%, and Unilever N.V. an interim of 7%, the equivalent of the Unilever dividend calculated under the equalisation agreement, on account of 1959 on capitals increased by one-for-four scrip issues.

A year ago Unilever declared an interim of 1s 4.8d per £1 unit, equivalent to 5 3-5ths% on the present capital, plus a special interim equal to 2 4-5ths%. The 1958 Unilever N.V. interim was equivalent to 5% paid together with a second interim equal to 2 2-5ths%. The second interim paid last December arose from the special circumstances relating to the tax issues by the Dutch companies.

B. F. Goodrich Co.

Net sales for the nine months ended 30 September for B. F. Goodrich Co. totalled $578,478,605 ($508,465,253). Net income is equal to $3.20 ($2.61) a share.

Celanese Corp.

Net sales of Celanese Corporation of America for the nine months ended 30 September totalled $193,357,991 ($163,573,099). Earnings are equal to $1.67 (89 cents) a share of common stock.

Deutsche Shell-Chemie

The board of the recently-formed German petrochemical concern, Deutsche Shell-Chemie GmbH (see C.A., 19 September), formed to deal with the production and sales of chemical products, plant protection media and mineral oil by-products, has announced a raising of its capital from the initial nominal sum of DM.50,000 to a level of DM.5,000,000 (about £416,700).

Du Pont

A year-end dividend of $2.50 has been declared on common stock by E. I. du Pont de Nemours and Co., U.S. This brings the total dividend payments for the year to $7 and compares with $6 paid in 1958 when a year-end dividend of $1.50 a share was paid.

Montecatini Activities

During the first half of the current year, Montecatini Co. and the companies in which they hold controlling interest, totalled Lire 100,226 million (£575 million) worth of sales or nearly 7.5% more than in January/June 1959. This situation continued also into the third quarter of the current year, in spite of the drop in prices of many products.

Eurunion

The chemical industry is the main industry represented in the funds of the recently founded common market area investment fund Eurunion, of Luxembourg. Some 13.55% of the combined holdings of the fund are taken up with chemical industry investments. The Eurunion body, set up at the end of February with some £2 million, was by the end of its first six months of existence worth well over £5.75 million. The governing concern, Soc. de Gestion pour l'Investissement dans le Marché Commun, states that of the 572,000 Eurunion shares, 27.23% are held by France, 25.58% in West Germany, 21.23% by Holland, 14.22% by Italy and the remainder by the Belgo-Luxembourg Union.

Shawinigan Chemicals

Earnings of Shawinigan Chemicals, Montreal, for the first nine months of 1959 were considerably better than for the same period last year and dividends from that company amounted to $625,000 ($229,000 for the whole of 1958) state the parent company, Shawinigan Water and Power.

Swiss Petrochemicals

Two new companies connected with the petrochemical industry have been registered in Switzerland. They are Petrolholding S.A., of Bellinzona, a company to buy up holdings in foreign companies in the mineral oil processing industry (initial capital SFr. 3,500,000 or £292,000) and BP Exploration S.A., of Fribourg, formed to obtain by purchase or concession oilfields, exploit them and attend to the processing of crude oil to fuels, heavy derivatives and other by-products (initial capital equivalent to £167,000).

Ugine

The chemical concern Société d'Electro-Chimie, d'Electro-Métallurgie et des Acières Electriques d'Ugine is contemplating a future capital expansion from its present level of FFrs.19,900 million to one of as much as FFrs.50,000 million. This is not projected for the near future, however.

NEW COMPANIES

INTERNATIONAL ORE AND FERTILIZERS (U.K.) LTD. Cap. £100. To act in Great Britain or any other part of the world as agents and representatives; to deal in ores, metals, minerals, chemicals and chemical products, fertilisers, etc. Solicitors: Simmons and Simmons, 1 Threadneedle Street, London E.C.2.

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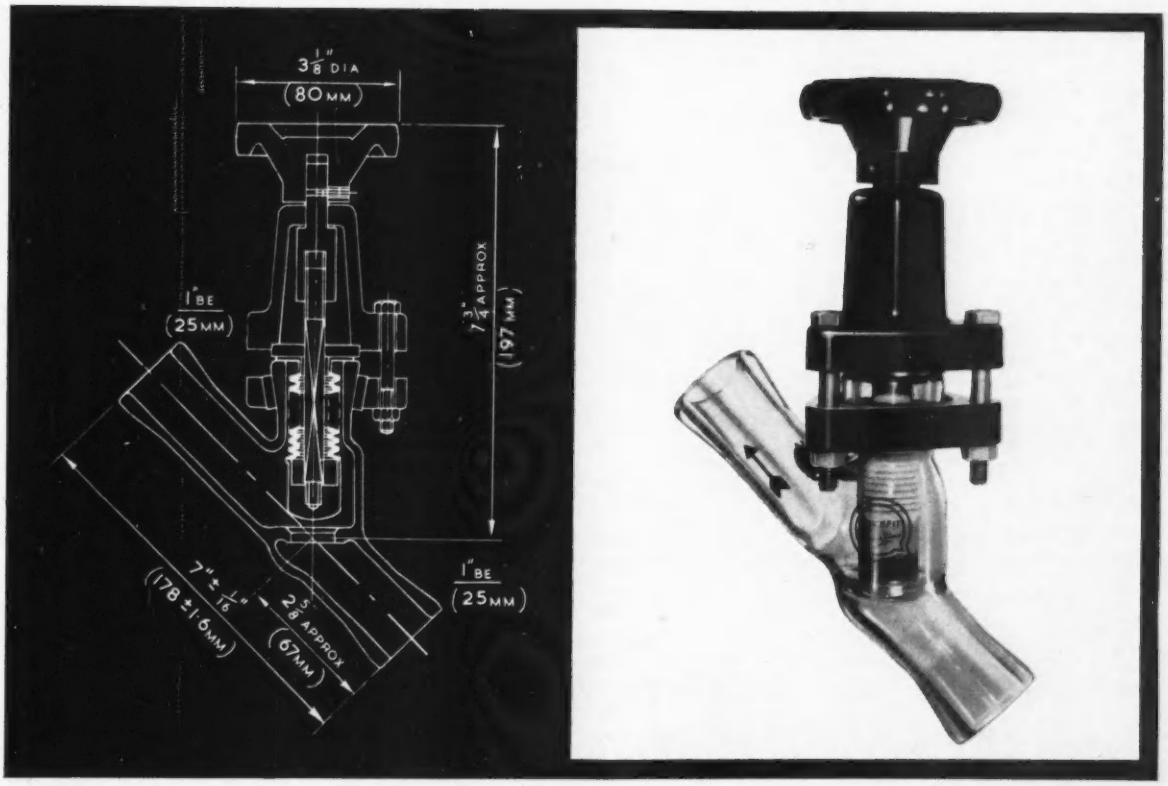

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TRADE NOTES

Drawback on Sodium Chlorate

The Treasury have made the Import Duty Drawbacks (No. 10) Order, 1959, which reduces the rate of drawback on imported sodium chlorate used in the manufacture of exported weedkiller. The order came into operation on 16 November 1959 and has been published as S.I. 1959, No. 1879.

Durco Plug Valves Made in U.K.

Popular sizes of the straight-through Durco type 'F' plug valve are now in production by Langley Alloys Ltd., Langley, Slough, Bucks, and it is announced that the entire range will shortly follow.

This American valve with p.t.f.e. sleeve is of simple and sturdy design, well known in the U.S. in the chemical engineering field.

Reddish Detergents Formed

Formation of Reddish Detergents Ltd., Stanley Road, Cheadle Hulme, Cheshire, is announced to take over certain commitments previously handled by the Reddish Chemical Co. Ltd. A new range of detergents for cleaning milking equipment on the farm has been developed, and a technical brochure 'Detergents for the Farm' published. The new company will have a range of detergents for the food and metal industries, and will also specialise in manufacture of products for firms wishing to market their own formulations.

Head, Wrightson Publications

Latest publications from Head Wrightson and Co. Ltd., 20 Buckingham Gate, London, S.W.1, are entitled the 'Cyclone Washer', and 'The Strip Process'.

The former describes equipment for mineral concentration at the lowest size ranges, as developed by the Dutch State mines, and used with success in many parts of the world; while the second publication deals with a Swedish process for the up-grading of poor quality ores.

Houdry 'Litol' Process

Further information on the Houdry 'Litol' process (CHEMICAL AGE, 7 November, p. 651)—a new dual-purpose one-step catalytic process for purification and dealkylation of aromatic light oils—may be obtained from the firm's London representative at 21 Ironmonger Lane, London E.C.2.

Texas Sales Organisation

With the appointment of distributors in Belgium, Germany, Norway and Italy, Texas Instruments Ltd., Dallas Road, Bedford, continue the expansion of their European sales organisation for semiconductors. The new distributors are Societe Industrielle Alfa S.A., Belgium; Alfred Neye GmbH, West Germany; Sisram s.n.c., Italy; Morgenstierne and Co., Norway.

Silicone Rust Inhibitor

Amber Chemical Co. Ltd., 11a Albemarle Street, London W.1, have introduced an Electrospray composed of a silicone based anti-tracking fluid containing a rust-inhibitor, packed in an aerosol container. The Ambersil Electrospray has been found ideal for electrical equipment where good surface insulation is required under high humidity conditions. The product has high surface resistivity, is clean, inert, water-repellent, non-inflammable, and has excellent anti-stick qualities.

U.K. Agent for Demag Compressors

The Compressor Division of Demag, AG, Duisberg, have recently signed an agreement with William H. Capper and Co. Ltd., Mayfair House, 8/9 Hertford Street, London W.1, under which the British firm is appointed sole representative in the U.K. and N. Ireland for the sale of all the products of the department.

New Telephone Number

The telephone number of Richard Scale and Co. Ltd., Albert Street, Bulwell, Nottingham, is now Bulwell 271441.

Adhesives Guide

To meet the need of its member firms for information about adhesives, the British Scientific Instrument Research Association has had prepared 'Adhesives Guide' by Joyce Hurd. Requests for adhesives suitable for members' requirements have shown that while there are good books and papers on the science of adhesives and adhesion, and numerous practical texts about particular types of adhesives or particular applications, there has not previously existed any comprehensive list of adhesives commercially available in Great Britain, nor one inclusive guide to their properties.

DIARY DATES

MONDAY 23 NOVEMBER

Bradford Chem. Soc. & S.C.I.—Bradford: Inst. Technology, 7 p.m. 'I.R. spectra of 2,5-diphenyl-1, 4-benzoquinones', and 'Some aspects of filtration'.

R.I.C.—Dartford: N.W. Kent College, Miskin Rd., 7 p.m. 'Chemistry in veterinary science', by S. L. Hignett.

TUESDAY 24 NOVEMBER

I.Chem.E.—London: R.I., Albemarle St., W.1, 2.30 p.m. Symposium on nuclear energy.

Soc. for Visiting Scientists—London: 5 Old Burlington St., W.1, 7.30 p.m. Discussion meeting on food processing: dinner, 6.15 p.m.

S.A.C.—London: C.S., Burlington Hse., W.1, 6.30 p.m. Annual meeting of Physical Methods Group and paper on 'Design of optical instruments for chemical analysis', by R. A. C. Isbell.

WEDNESDAY 25 NOVEMBER

Inst. Fuel—London: Instn. Civil Engineers, Gt. George St., S.W.1, 5.30 p.m. Melchett lecture, 'Surface: a common problem for research and engineering in fuel technology', by P. O. Rosin.

R.I.C.—Walthamstow: S.W. Essex College, Forest Rd., E.17, 7 p.m. 'Some new developments in chemistry of free radicals', by Prof. F. S. Dainton.

S.A.C. and Pharm. Soc.—London: 17 Bloomsbury Sq., W.C.1, 7.30 p.m. Meeting on 'Methods of assays of capsicum, lonchocarpus and rauwolfia'.

THURSDAY 26 NOVEMBER

Fertiliser Soc.—London: Geological Soc., Burlington Hse., W.1, 2.30 p.m. Three papers on weighing machines.

Inst. Pet. and S.C.I.—London: F.B.I., 21 Tothill St., S.W.1, 9.30 a.m. Symposium on 'Corrosion problems of petroleum industry'.

Liverpool Joint Chemistry Cttee.—Liverpool: Radiant Hse., Bold St., 7 p.m. Annual scientific film show.

Soc. Instrument Technology—Chester: English-Speaking Union, Stanley Palace, Watergate St., 7 p.m. 'Science in detection of crime', by A. Thompson.

FRIDAY 27 NOVEMBER

Royal Inst.—London: 21 Albemarle St., W.1, 8 p.m. 'Research in war against locusts', by Dr. P. T. Haskell.

Soc. Instrument Technology—Glasgow: Building Centre, 7.15 p.m. 'Magnetic flow-meter', by B. W. Balls.

Market Reports

BETTER INTEREST IN TEXTILE CHEMICALS

LONDON Active trading conditions have again been reported on the chemicals market with home industrial outlets calling for good quantities against contracts. The flow of export enquiry also continues on a satisfactory scale. Demand has been fairly general with buyers looking beyond immediate requirements, and the better interest in textile and bleaching materials has been maintained.

Prices are little changed and the undertone is firm. Fluctuations in non-ferrous metal prices are reflected in the quotations for the chemical compounds with zinc oxide, red seal, £109 10s per ton as at 16 November after being £2 per ton lower during the previous week. White lead, red lead and litharge were reduced by £1 15s per ton as from 12 November, the current basic price for dry white lead being £117 10s per ton.

The demand for fertilisers remains steady and the price position is unchanged.

In the coal tar products market there has been a steady demand for the naphthalenes, creosote oil and cresylic acid, while pitch is moving well on home and export account.

MANCHESTER There has been a fair flow of new enquiry on the Manchester market for heavy chemical products during the past week. In the home section, industrial users are maintaining a steady demand for contract deliveries of alkalis, ammonia and magnesium compounds, and a wide range of miscellaneous chemicals. On the export side, shipping business is on a satisfactory scale, with Commonwealth outlets mostly making a good showing. The demand for fertilisers is featured by a brisk call for basic slag, with a fair movement of compounds and of nitrogenous varieties. In the tar products market there is reasonably steady movement of creosote oil and cresylic and carbolic acids.

SCOTLAND Little alteration has taken place during the past week in the Scottish heavy chemical market and buying generally has continued fairly active in most sections of industry. Interest is beginning to be shown in contract requirements for the coming year, while deliveries against current contracts are being well maintained. Prices on the whole have remained firm. Conditions on the export market are reasonably active, with quite a volume of inquiries being received.

NEW PATENTS

By permission of the Controller, HM Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

ACCEPTANCES

Open to public inspection 31 December

Stabilisation of aqueous colloidal solutions of silica. Atlantic Refining Co. **826 219**

Aminothioacid esters, and the production thereof. Chemie Grünenthal GmbH. **826 300**

Collapsible floating containers for liquids. Esso Research & Engineering Co. [Cognate application 30 076.] **826 301**

Process for refining coke-forming hydrocarbon distillates. Universal Oil Products Co. **826 305**

Open to public inspection 6 January

Monoazo dyestuffs containing dichlorotriazinylamino groups. Imperial Chemical Industries Ltd. **826 405**

Retrocortin esters and their preparation. Merck & Co. Inc. **826 360**

Hydroretrocortin and derivatives of hydroretrocortin. Merck & Co. Inc. **826 361**

Steroid compounds and therapeutic compositions containing them. Merck & Co. Inc. **826 362**

Retrocortin derivatives and their preparation. Merck & Co. Inc. **826 363**

Cyclopentanopolyhydrophenthrene compounds. Merck & Co. Inc. **826 364 & 826 366**

Steroid compounds. Merck & Co. Inc. **826 365**

Dyeing process. Imperial Chemical Industries Ltd., Mills, W. P., Rattee, I. D., and Stephen, W. E. **826 375**

Organolead compounds. Ethyl Corps. **826,475**

Production of penicillin. Anderson, G., Davis, L. J., and Davey, V. F. **826 482**

Polymeric compositions. Petrochemicals Ltd. **826 483**

1-Thienyl-aminopropanol derivatives. Sterling Drug Inc. **826 487**

Alkali metal carbonate manufacture. Diamond Alkali Co. **826 387 & 826 388**

Dyeing process for protein textile materials. Imperial Chemical Industries Ltd., Hadfield, H. R., Batterbee, B., and Lemin, D.C. **826 376**

Protection of metals against corrosion. Petrocokino, D. D. **826 494**

Chlorinated polyethylene and process for production thereof. Phillips Petroleum Co. **826 495**

Substituted piperazines and methods for obtaining same. Parke, Davis & Co. **826 496**

Cermets with high impact strength. Union Carbide Corp. **826 391**

Alumina-base cermets. Union Carbide C. **826 392**

Recovery and purification of polymers. Phillips Petroleum Co. **826 416**

Preparing a hydrocarbon reactant conversion. Kellogg Co., M. W. **826 424**

Stabilised non-gelling aqueous dispersion compositions and process of making same. Du Pont de Nemours & Co., E. I. **826 455**

Dicyandiamide-phenol-aldehyde resinous compositions and laminates prepared therefrom. Westinghouse Electric Corp. **826 458**

Preparation of Δ^1, ^{4}—steroids. American Cyanamid Co. **826 395**

Δ^1, ^{4} Pregnadienes. American Cyanamid Co. **826 396**

Triazine derivatives and a process for their production. Cassella Farbwerke Mainkur AG. **826 323**

Non-sulphur cure of rubbery copolymers. Esso Research & Engineering Co. **826 436**

Treating proteins to render same resistant to putrefaction. Borden Co. **826 326**

Therapeutic compositions. American Home Products Corp. **826 328**

Methods of producing non-ferrous metal powder from a solution or slurry of a compound thereof. Sherritt Gordon Mines Ltd. **826 337**

Retrocortin derivatives. Merck & Co. Inc. [Divided out of 826 363.] **826 367 & 826 368**

Activation of platinum-containing catalysts. Bataafsche Petroleum Maatschappij NV., De. [Addition to 782 787.] **826 448**

Separating a mixture into components by means of a zeolitic molecular sieve sorbent. Bataafsche Petroleum Maatschappij NV., De. **826 449**

Steroid compound. Merck & Co. Inc. [Divided out of 826 364.] **826 369**

Purifying gaseous ketene. Lonza Electric & Chemical Works Ltd. **826 491**

Alfred Bird's New Research Laboratories

THE NEW Alfred Bird research laboratories, built in nine months at a cost of £120,000, comprise two product development laboratories, an analytical laboratory, instrument room, dark room, fume and balance rooms, research kitchen, process development area containing pilot plant, library and general offices.

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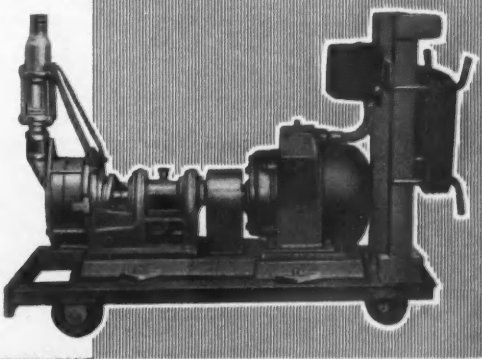

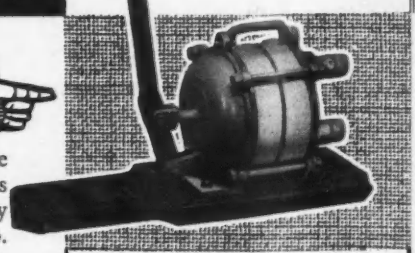

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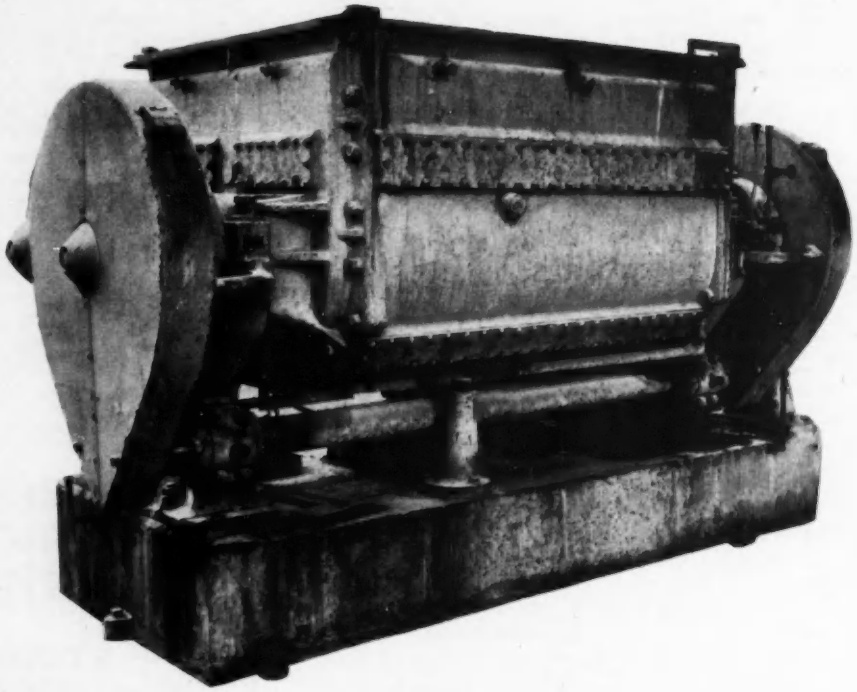

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1, 9-Dibromononane
1, 10-Dibromodecane
1, 11-Dibromoundecane
1, 4-Dibromobutene-2
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2, 5-Dibromo-hexene-3
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3, 8-Dimethyloctanediol-2, 7
2, 7-Dimethyloctadiyne-3, 5-diol-2, 7
3, 8-Dimethyldecanediol-3, 8
3, 8-Dimethyldecadiyne-4, 6-diol-3, 8
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1, 6-Dimorpholinyl-hexadiyne-2, 4
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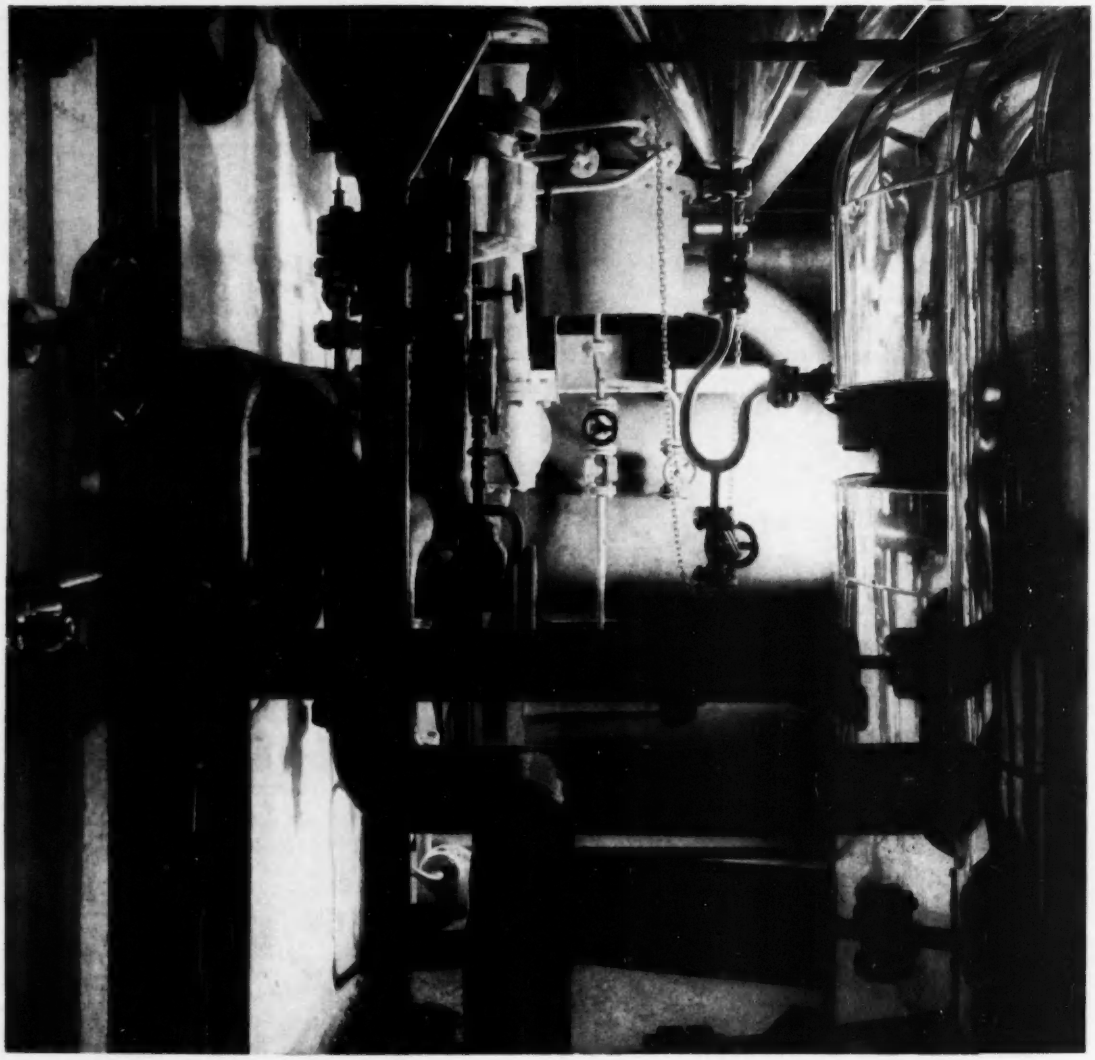
Pentamethylene dinitrile
n-Pentadecanoic acid nitrile
*Pentadecanediol-1, 15
*Pimelic acid
Pivalic acid
*Pyrroline
trans-Stilbene
Suberic acid
Serotonin creatinine sulphate
Tetradecandioic acid dimethylate
1, 2, 3, 4-Tetrahydroisoquinoline
1, 2, 3, 4-Tetrahydroquinoline
Tetrahydropyran
*Tetradecanediol-1, 14
Tridecylic acid
*Thapsic acid
*Tridecylic alcohol
n-Tridecanoic acid nitrile
Triacosylic acid
n-Triacosylic alcohol
n-Triacosanoic acid nitrile
Tridecandioic acid dimethylate
Tri-n-octylamine
Undecanediol-1, 11
DL Tryprophane (pharm:)
Undecandioic acid dimethylate
Undecamethylene dinitrile

* Not yet available

Process Technique



We build in particular plants for the oil and fat processing industry, for the production of hydrofluoric acid, aluminium fluoride, cryolith, sodium hydrosulphite and Rongalit, as well as continuously working mixing and kneading machines, evaporation and drying equipments, dry type acetylen generators

Buss Ltd. Basle/Switzerland

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